Figure Reading or
Rapidity in the Simple Rules

[illegible]

BY P. McINTOSH

The Commercial Text Book Company
Toronto, Canada

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ed.

FIGURE READING

OR

RAPIDITY

IN THE

SIMPLE RULES

3rd EDITION

By P. McINTOSH

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Rapid Addition

To the Student

RAPID addition is the first requisite in rapid calculation. You can learn to add rapidly if you set about it properly. Perhaps your inability to add rapidly now is due largely to haphazard methods of instruction and practice. We can remedy all that. Get rid in starting of any idea that you "Can't Add!" In the next place make up your mind to work. Not so very hard either, but steadily and regularly. Put twenty minutes a day on this work for a few weeks, and we can guarantee results that will please you.

This is our plan. Starting with Page 6 we suggest first a little drill on the addition table. You will notice at the top of the page two rows of figures. The top number in every case is 2. The figure 2 is to be added to the figures placed in the line below it in the following manner: Place a pencil below the left-hand figure and run towards the right as if drawing a line across the paper. As you come to each figure in the row, name the sum of its addition to 2. The sums for the first few additions are as follows: 6 (4 and 2), 7 (5 and 2), 9 (7 and 2), 11 (9 and 2), and so on. When you reach the right of the row, come back over the list in the same way. It is a simple practice, but it has important lessons for you. You must acquire from it fluency in naming figures. Cut out even unnecessary thinking. If you come to the figure 5 in the row, don't think it over as 5 and 2 are 7, but say promptly, 7, and so on. Then again let the numbers fall from your lips regularly, just as you do when you start at one and count up to one hundred. To do this start slowly. You are not expected to have top speed on the first trial. Don't rush over the easy ones and halt and stammer over the ones that are harder. Your work must be perfectly regular. Go over the list again and again until you acquire this fluency and regularity. Let your speed increase gradually. If you want to vary the practice, write a string of figures for yourself in a different order. We prefer this to jumping from figure to figure in any order, as this last method of practice is likely to interfere with that perfect smoothness at which you should aim. When you have completed practice with 2, imagine the figure in the top row to be 12, then 22, then 32, and so on, until you can name their sums without a trace of hesitation.

Before going further it may be well to understand the arrangement of the rest of the page. You will notice, in the margin to the left, a string of figures from 1 to 30 and across the top a row of letters from A to O. These are the guide figures and letters, by means of which we are able to block out questions for you, from the page of figures, without calling out the figures themselves. To illustrate—take your lead pencil and on page 6 draw a line right across the page from guide figure 3. You will notice the guide figures are opposite the spaces between the rows, so that you may draw your line without interfering with any of the figures. Next draw a line across the page from guide figure 10. Then drop a line from guide letter G and another from guide letter J. The whole indication reads as follows:—

3—10—G—J

The question you have thus blocked out appears as follows:—

221
212
222
212
221
121
222

In the same way a large number of questions may be blocked out by giving simply the guide figures and letters. As the paper would soon become defaced by ruling pencil lines, we use the markers supplied instead.

Now that you understand the idea of the whole page, you will better appreciate the full list of drills that may be practiced, and which are shown herewith.

In all your work you will find a metronome, or time counter, a material help, though it is not absolutely necessary. It simply beats out regular time and can be made to run fast or slow as you desire. We show with each drill the speed at which the drills may be started, and also the rate you should try to attain. In your private practice you will find that as you increase your speed you will have to stop trying to actually call out the numbers as you may let the eye run up a column and the mind follow at a rate that would make it impossible to say the words.

Addition Drills

(Using page 6 for example)

(1) Drill on the table at the top of the page. Metronome 84 to 160.

(2) Take the same drill on any of the thirty rows of figures on the page, *i.e.*, consider the addition of each figure to the figure 2, etc. Metronome 84 to 160.

(3) Drill on the table at the top of the page, considering each figure 12, 22, 32, 42, etc. Metronome 84 to 152.

(4) Drill on any of the thirty rows of figures in the same way. Metronome 84 to 152.

(5) Drill on one of the columns after the following manner: Place a marker opposite, say, row 6. Run from that to the top. Drop the marker one row and run up the same column to the top again. Continue in this way until at last you are reading from the bottom of the column to the top. Metronome 92 to 176.

(6) Place a marker opposite, say 7, and run all columns from that to the top. Start at the right side of the page and work across to the left side just as in any question in addition, only do not carry from one column to another. Metronome 92 to 176.

(7) Work out the same practice as noted in 6, only carry from one column to the next. Metronome 92 to 176.

(8) Practice in horizontal addition by running the addition of the different rows across the page. Metronome 92 to 176.

These drills should be practiced as an introduction to any work on a series of questions. After ten or fifteen minutes of such work, get a pen and paper in shape and work out a series of questions.

Even in the simple matter of putting results on paper, you should aim at neatness as well as accuracy. Follow the form shown herewith. Note on the paper the time it takes to work the ten questions. Preserve your sheets and do not be afraid to try the same series again and again, getting a better time result with every trial, until you feel that you read the columns with the same ease that you would draw a lead pencil line up or down the page. One hundred figures a minute, at least, should be your aim in speed. Block out a question 5 figures wide and 20 figures deep, or 4 figures wide and 25 figures deep. Put your watch before you and try for the answer in one minute

Look carefully to your everyday methods and habits. Some students never become rapid because they lack sharpness in all their movements. Cultivate a brisk gait on the street instead of ambling along. When you take your place at the desk sit erect. If you have occasion to rise in your place, stand up. Don't get up with the aid of the desk or the back of the chair as if in pain. Cultivate a briskness in all your movements and actions, and rapidity in addition will very naturally follow the practices we have outlined.

W. BROWN SEC. A. No. 6 MAY 4, 1907

	QUESTIONS	ANSWERS
1	[illegible]—12—F—J	[illegible]075
2	3—13—G—K	[illegible]
3	2—14—H—M	200[illegible]19
4	3—15—I—N	[illegible]1110
5	4—16—K—R	22028
6	3—18—J—N	26655
7	5—17—E—I	20929
8	6—19—D—H	22112
9	4—18—[illegible]—G	23340
10	3—17—A—F	243322

To the Teacher

The instructions given to the student will give a good idea of the order of conducting class drills. The first duty of each student will be to open his book at the page on which practice is being given, to prepare the half sheet foolscap on which indications and results are to be jotted down, and to see that his markers are in readiness.

After the material has been placed in readiness, a drill of fifteen minutes in concert may be given before a series of questions is set for individual work. For this concert drill we believe a metronome to be a valuable aid. The same drill suggests to the student for his private work may be followed in the class. It will be found rather difficult, however, to work the whole class up to the same rate of speed as suggested for the individual, especially where a large number of students are being handled. We believe in spending a week on each page. With each succeeding day, the practices must be carried out at a higher rate of speed, the drills on reading columns of figures increased in length, and the questions assigned for individual work made more difficult until, at the end of the week, students are reading from the base of the page to the top without difficulty. We have made the columns thirty figures in length because, with an average run of figures, this will easily carry the addition to one hundred and over. After the hundred point is reached, the work is a mere repetition, and students may be instructed to omit, in all this work, the calling out of the hundreds, simply jotting down 1, 2, 3, etc., as the length of the column may carry them past one hundred, two hundred, and so on.

When the concert practice is finished, a series of questions may be assigned for individual work. If ten questions are assigned, every student should be required to work the full list, no matter how long it takes him. This may be arranged by having the rapid calculation period precede some study or individual instruction period. As each student finishes his addition, he may pass in his papers and proceed with the next line of work.

To give some idea of what is being actually done in the class, the student first finished with his ten questions may raise his hand. The teacher may announce the fact, and each student may put a check mark on his paper directly opposite the last complete answer. Work is not stopped until the ten questions are completed. By this means we get a record of what the student is doing as against the best record of the class. One minute tests may also be given on hundred figure drills. Block out a question 5 by 20 or 4 by 25, and hold the class to one minute for the answer. It is a speed any good adder should have.

Papers are collected, answers checked, and returned to the student before the close of the day. The name of the leading student, with his time, may be put on the board together with a list of correct answers. The students may thus check their results, and by keeping each day's exercises, acquire the means of checking all their private practice.

2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
4 5 7 9 8 4 5 2 8 1 6 4 5 3 4 5 1 8 7 6 7

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	2	1	2	2	1	2	1	2	1	2	2	1	2	1	2
2	1	1	1	2	2	1	2	2	2	1	2	2	1	2	1
3	2	2	2	1	1	2	2	1	1	1	1	2	2	2	2
4	2	2	1	1	1	1	2	2	2	1	2	1	2	1	2
5	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1
6	1	1	2	2	1	2	2	2	2	2	2	2	2	2	2
7	2	2	1	2	1	2	1	2	1	2	1	2	1	2	1
8	1	1	2	1	2	1	1	2	2	1	2	1	2	1	2
9	2	2	1	1	1	2	2	1	2	1	2	2	1	2	1
10	2	1	2	2	2	1	1	2	2	2	2	1	2	2	2
11	1	2	2	1	1	1	2	2	1	1	1	2	1	1	1
12	2	1	1	2	2	2	1	2	2	2	2	2	2	2	2
13	1	2	2	1	2	1	2	1	1	2	1	2	1	2	1
14	2	1	2	1	2	2	1	2	1	1	2	1	2	1	2
15	2	2	2	1	1	1	2	1	2	2	1	1	2	2	2
16	2	1	1	2	2	2	1	2	2	1	2	2	1	2	1
17	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1
18	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
19	1	1	2	2	1	1	2	2	1	1	2	2	1	1	2
20	2	2	1	1	2	2	1	2	2	2	1	1	2	2	1
21	1	1	1	2	2	1	2	1	1	2	2	1	1	2	2
22	2	2	1	1	2	1	1	2	2	1	1	2	2	1	2
23	1	1	2	2	2	2	1	1	2	2	1	2	2	2	1
24	2	2	1	2	1	2	1	2	1	2	1	2	1	1	2
25	1	2	2	1	2	1	2	1	2	1	2	1	2	1	2
26	2	1	1	2	2	2	1	2	1	2	1	2	2	2	1
27	1	2	1	1	1	2	2	1	1	1	2	2	1	1	2
28	2	1	2	1	2	1	2	1	2	1	2	1	2	2	1
29	1	2	1	1	1	2	2	1	1	2	1	2	1	2	2
30	2	1	2	1	2	1	2	2	2	1	2	1	2	1	2

WORK SERIES 1 TO SERIES 6. See page 64

36 38 31 33 32 39 38 35 36 34 33 38 37 34 39 35 33 34 32 35

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	1	3	2	2	1	2	3	3	1	2	1	3	2	2	1
2	3	2	1	2	3	2	2	1	3	2	3	1	3	1	2
3	2	2	3	1	2	3	1	3	2	1	3	3	3	3	3
4	3	3	2	2	2	3	3	1	1	2	2	2	1	2	2
5	1	1	1	3	3	3	2	3	2	3	2	1	3	3	1
6	1	3	2	3	2	3	1	3	1	2	3	2	3	1	2
7	3	2	1	1	3	2	3	3	2	3	1	1	3	2	3
8	2	1	1	3	3	2	3	2	1	3	2	1	3	2	1
9	3	2	2	2	2	2	2	1	1	3	2	3	1	3	2
10	3	1	2	3	1	2	3	1	3	3	1	2	3	1	2
11	2	2	3	1	1	3	2	2	2	2	2	2	1	3	1
12	1	3	2	1	3	2	1	3	2	1	3	2	1	2	2
13	2	1	3	2	3	2	3	2	3	2	3	2	3	3	1
14	3	3	2	2	2	2	1	1	1	1	3	2	1	2	3
15	1	3	2	3	2	1	1	3	3	2	1	3	2	3	1
16	2	3	2	3	3	2	2	1	1	3	2	1	3	2	1
17	1	3	2	1	1	3	2	1	3	2	1	3	2	1	3
18	3	2	2	2	2	1	3	1	2	3	3	2	3	3	3
19	2	1	3	3	3	3	2	3	3	3	1	2	3	2	3
20	1	3	2	3	2	1	3	2	1	3	2	1	3	2	1
21	3	1	2	3	3	1	2	2	3	2	1	3	3	2	3
22	2	2	1	3	3	2	3	1	3	1	3	2	3	1	2
23	1	3	2	3	2	3	1	3	1	2	3	3	2	3	3
24	1	3	3	2	1	3	2	3	1	3	3	3	2	2	2
25	2	2	2	1	3	2	3	2	2	1	1	2	1	3	1
26	3	2	1	3	2	1	3	2	1	3	2	3	3	2	3
27	1	3	2	1	3	3	2	1	3	3	2	3	1	2	2
28	3	3	3	1	3	2	3	1	3	2	2	3	3	2	3
29	1	3	2	2	1	3	2	3	2	1	3	2	3	1	2
30	2	1	1	3	2	2	1	2	1	3	1	3	1	2	1

Work Series 7 to Series 12.

4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
2 4 1 3 2 4 7 6 3 4 2 9 4 5 8 5 7 6 8 9

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	4	3	1	2	4	3	2	4	4	1	2	3	3	1	2
2	1	4	2	1	3	2	4	1	3	2	4	4	2	4	4
3	3	2	4	4	1	4	3	4	3	2	4	3	2	1	3
4	2	3	1	3	3	2	4	2	3	1	3	2	3	1	2
5	4	1	1	1	3	3	2	2	4	4	1	2	3	4	1
6	2	4	3	1	2	4	3	1	3	4	2	2	3	1	2
7	4	4	3	3	2	2	1	1	3	2	1	3	3	2	3
8	4	3	2	2	2	2	3	1	2	3	2	4	1	3	2
9	3	2	1	1	3	2	3	4	4	2	3	4	2	1	4
10	1	3	2	2	4	3	2	1	3	2	1	2	3	1	3
11	3	2	4	3	3	2	2	4	4	1	1	3	2	4	4
12	3	2	1	3	2	4	4	1	2	4	4	3	2	3	3
13	1	3	4	2	3	4	1	2	3	4	1	1	4	2	2
14	3	4	3	4	2	1	3	1	2	4	3	1	2	3	3
15	4	1	3	2	2	4	3	2	1	3	2	2	3	3	4
16	1	3	2	4	2	3	4	1	2	4	4	3	4	1	4
17	3	4	2	3	4	1	3	4	4	3	4	2	1	4	3
18	2	3	4	1	3	4	2	3	1	4	1	3	2	1	4
19	4	1	3	4	2	4	1	3	4	2	3	1	3	2	3
20	1	3	2	4	4	1	4	1	3	4	1	4	2	4	1
21	3	1	1	1	3	3	3	2	2	2	4	3	2	1	4
22	4	4	4	3	3	3	2	1	1	3	4	3	4	3	1
23	1	3	2	2	4	3	2	1	3	4	3	2	1	4	3
24	4	3	1	2	3	1	4	3	4	2	4	3	2	3	1
25	2	2	2	1	3	3	4	1	3	2	3	4	1	2	5
26	3	1	2	3	1	4	2	3	4	2	1	3	2	1	4
27	3	2	2	1	3	4	4	4	1	2	3	4	2	4	1
28	1	4	3	2	4	3	2	1	3	2	3	3	4	3	2
29	1	2	3	4	2	3	4	2	3	4	1	2	3	4	1
30	4	2	3	1	3	4	2	3	4	1	3	4	1	2	3

WORK SERIES 13 TO SERIES 18. See page 64

5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
7 3 8 6 9 3 1 4 5 3 8 9 6 7 4 3 7 9 5 3

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	2	4	1	3	4	1	5	3	2	5	4	3	2	3	2
2	5	3	3	5	3	1	2	3	4	3	2	1	5	3	3
3	4	4	4	3	3	3	2	2	2	1	1	1	5	5	4
4	1	3	5	3	2	5	4	1	3	2	3	4	1	3	5
5	3	1	5	4	3	4	3	4	2	4	3	5	3	2	3
6	4	4	3	2	1	3	2	3	5	3	4	2	3	2	1
7	3	2	4	1	3	3	1	1	1	2	5	3	4	2	5
8	3	5	1	3	2	5	3	3	4	3	2	5	3	1	5
9	4	5	3	4	2	5	3	1	3	2	4	3	2	3	4
10	1	4	2	5	2	3	4	4	3	2	4	5	2	1	2
11	3	2	4	3	2	5	3	2	1	4	3	1	2	3	3
12	5	5	4	4	3	3	2	2	5	4	3	2	3	4	4
13	3	3	2	4	5	1	5	2	5	3	4	2	1	5	3
14	3	2	3	3	2	3	2	4	4	5	3	2	3	3	2
15	2	2	2	5	5	5	4	4	3	3	2	3	5	1	5
16	4	3	2	2	3	4	5	1	3	2	3	1	3	4	3
17	1	1	3	4	2	3	3	4	3	2	3	4	5	3	2
18	5	3	2	3	1	3	2	3	2	3	4	3	2	3	1
19	4	3	1	4	3	2	3	4	5	3	4	3	2	4	4
20	3	2	3	3	2	3	4	3	2	3	5	3	2	3	5
21	1	2	3	4	5	5	4	3	2	1	1	2	3	4	4
22	4	5	5	3	3	2	2	4	2	3	4	1	5	3	2
23	3	3	1	2	2	3	4	2	1	3	4	2	4	3	2
24	3	5	3	4	2	1	3	4	5	1	2	3	1	3	4
25	3	5	3	1	1	4	5	3	2	3	4	3	2	4	3
26	1	3	2	2	5	3	1	3	4	5	5	3	3	1	3
27	5	2	1	3	2	4	3	1	3	2	5	3	1	3	2
28	3	1	4	2	3	3	4	2	1	4	4	4	4	4	4
29	1	4	3	3	3	3	3	2	4	3	5		3	1	3
30	2	3	1	1	3	4	3	3	1	3	2	2	5	3	2

Work Series 19 to Series 24.

6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
4 5 6 7 8 9 2 4 8 6 7 9 5 6 8 5 4 7 3 9

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	5	4	6	4	6	2	3	6	4	3	6	4	6	1	6
2	6	1	4	5	3	6	6	3	5	6	1	3	6	4	2
3	4	6	6	5	1	5	3	6	6	4	6	6	2	6	5
4	1	5	3	6	6	3	1	3	2	6	5	3	1	5	3
5	3	6	4	6	6	5	2	6	4	6	1	6	2	5	1
6	2	3	4	5	1	6	6	6	4	5	6	6	6	6	6
7	6	3	3	3	3	5	5	5	6	6	2	3	4	4	6
8	6	4	4	6	1	2	3	4	5	6	5	6	5	6	5
9	4	6	4	6	4	6	4	6	4	6	4	6	4	5	5
10	3	3	6	3	6	3	6	3	6	3	6	1	6	2	3
11	6	1	3	4	5	2	6	3	1	3	4	4	5	1	4
12	3	5	6	6	6	6	5	6	6	6	6	6	6	6	6
13	2	6	4	6	5	6	3	6	2	6	4	6	1	3	5
14	4	5	6	1	6	2	6	1	3	2	5	5	4	2	1
15	6	5	5	6	3	5	4	6	4	6	6	4	6	6	6
16	4	4	5	5	1	2	3	4	5	3	4	6	5	1	3
17	1	2	3	4	5	6	6	5	6	4	6	3	6	2	6
18	6	6	6	6	6	4	5	6	1	6	4	6	3	6	2
19	5	1	2	5	4	6	1	3	6	5	3	2	6	3	4
20	2	6	4	1	2	3	4	5	5	1	6	5	2	5	6
21	4	5	6	6	6	1	6	4	2	2	4	5	1	3	4
22	3	4	2	5	6	6	5	6	6	6	6	6	6	6	3
23	6	6	6	6	2	3	4	5	2	3	4	6	6	3	2
24	1	5	4	3	6	6	4	3	6	5	6	3	4	5	5
25	5	4	5	6	2	1	6	6	3	4	1	6	5	3	6
26	6	6	6	4	1	3	6	3	6	6	5	3	6	4	1
27	4	2	5	1	3	6	3	4	6	5	6	2	4	6	6
28	3	5	6	6	6	3	1	6	5	3	5	6	3	1	3
29	5	6	3	4	2	6	6	4	1	1	6	3	6	5	5
30	4	2	6	6	5	3	6	3	6	4	3	2	5	6	6

WORK SERIES 25 TO SERIES 30. See page 64

7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
5	8	9	3	2	1	7	9	4	5	3	8	7	4	5	9	8	2	6	8	6

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	5	6	7	2	4	3	5	6	7	4	7	4	1	7	7
2	7	4	7	3	2	7	7	1	7	3	5	7	7	5	3
3	6	7	1	1	4	4	5	7	1	3	5	4	1	3	7
4	4	3	5	7	6	4	7	3	4	6	7	[illegible]	5	3	1
5	1	7	6	4	7	4	3	5	6	7	4	3	2	6	6
6	7	7	7	5	5	7	4	7	3	2	7	4	6	7	7
7	3	4	5	6	7	6	7	4	7	5	5	7	7	2	4
8	1	1	2	7	3	4	5	6	4	7	3	4	5	7	7
9	7	6	7	5	4	7	5	7	6	5	3	7	4	2	5
10	7	4	5	7	3	5	7	4	7	4	7	5	7	6	1
11	2	3	4	5	6	7	4	5	6	7	5	6	4	7	7
12	3	4	5	7	5	4	6	7	5	1	4	7	1	3	2
13	5	7	7	4	3	1	1	6	7	4	7	5	7	7	6
14	6	4	1	3	7	7	7	5	4	7	4	5	7	3	7
15	4	5	7	5	7	6	7	3	7	4	7	1	7	4	7
16	7	4	1	3	7	4	5	7	5	7	4	7	4	7	3
17	5	7	5	7	4	7	6	2	[illegible]	4	5	5	6	7	5
18	5	4	3	2	1	6	7	5	4	3	2	1	5	3	4
19	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
20	1	2	3	4	5	6	7	5	4	3	2	1	3	6	5
21	6	7	5	7	3	7	2	7	4	4	7	5	7	3	7
22	4	5	7	4	5	6	7	1	7	3	7	4	7	3	1
23	7	4	3	1	7	4	5	6	3	1	4	5	4	3	7
24	5	6	4	7	4	7	5	1	4	7	4	7	4	7	6
25	6	7	7	5	1	5	7	7	7	5	7	4	7	4	3
26	1	2	5	4	3	7	4	5	3	1	2	5	6	3	5
27	5	6	7	7	7	4	7	7	5	7	4	7	1	7	7
28	3	7	4	5	2	7	4	1	3	5	6	3	6	1	1
29	5	3	7	2	1	3	5	6	7	7	7	4	7	5	4
30	7	3	3	3	3	3	5	6	6	6	4	5	6	3	2

WORK SERIES 31 TO SERIES 36.

8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
9 7 8 4 2 1 3 5 9 6 7 4 8 8 5 4 3 7 8 5 4

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	7	5	8	4	8	6	8	3	8	2	8	1	8	7	8
2	8	3	5	8	7	8	4	8	4	8	3	8	5	8	4
3	5	8	1	3	5	4	2	3	7	8	5	4	6	3	2
4	4	6	8	7	7	6	4	3	8	5	1	4	7	7	7
5	8	8	8	8	6	5	5	5	4	4	8	8	8	4	8
6	6	3	2	7	8	5	4	8	7	3	2	6	7	8	4
7	3	3	7	8	5	8	6	7	8	8	8	4	6	4	8
8	8	4	3	7	4	2	4	3	6	6	7	7	4	8	7
9	2	8	7	8	8	8	6	8	8	8	4	8	5	6	8
10	7	3	4	7	4	4	7	5	6	4	8	4	6	8	6
11	3	8	8	5	6	7	8	6	8	4	8	8	5	7	3
12	4	7	5	8	8	8	4	5	5	7	7	3	8	8	2
13	1	8	7	6	5	4	3	2	1	8	8	4	3	7	8
14	5	7	8	8	8	8	8	4	5	3	7	8	8	8	5
15	8	8	4	6	7	2	3	5	7	4	6	5	7	2	3
16	7	8	8	4	5	1	7	8	4	8	5	6	8	8	5
17	7	5	4	2	8	5	8	6	8	6	8	4	8	7	8
18	3	5	3	8	5	8	4	3	6	5	6	7	4	8	3
19	5	3	8	7	8	3	8	5	7	8	1	8	3	2	5
20	8	8	7	5	4	6	8	3	5	8	8	4	8	5	7
21	8	5	7	3	6	5	5	5	8	8	3	7	5	8	8
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23	7	3	6	5	8	8	8	8	8	8	8	8	8	8	8
24	2	8	8	8	6	7	4	5	3	2	5	4	6	7	1
25	8	4	3	2	7	8	8	5	6	7	8	3	5	5	8
26	4	6	7	4	5	7	3	8	5	4	6	7	8	8	4
27	7	8	3	5	8	5	8	3	8	4	8	6	5	8	8
28	5	7	5	7	5	8	5	8	5	8	5	8	8	2	4
29	5	7	8	2	5	8	4	8	3	7	8	4	6	8	8
30	8	3	5	8	8	3	7	6	8	3	2	8	8	4	7

WORK SERIES 37 TO SERIES 42. See page 65

9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9
3 2 7 8 9 5 6 4 1 8 9 6 5 3 4 9 7 6 2 7 8

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	8	9	7	4	9	1	2	9	4	9	3	2	9	5	7
2	9	4	3	7	5	9	7	2	9	9	6	3	4	8	9
3	5	9	9	7	4	7	9	9	5	2	5	6	9	3	8
4	7	9	9	5	9	9	4	7	9	4	9	9	9	9	9
5	2	3	4	7	5	6	8	9	1	2	3	4	5	6	7
6	3	9	8	9	5	6	7	4	7	8	9	9	4	3	3
7	8	2	7	5	9	9	8	9	3	9	5	7	9	9	8
8	1	9	4	3	8	2	9	7	9	4	9	6	8	7	9
9	6	8	4	9	4	7	5	2	8	5	4	9	9	4	5
10	4	7	9	5	7	6	9	9	3	9	9	7	8	5	3
11	9	9	5	4	7	9	3	5	7	2	3	4	5	6	7
12	5	6	9	8	7	9	7	9	4	9	7	9	8	9	9
13	8	3	2	9	4	6	7	8	9	1	3	2	5	4	3
14	4	7	3	5	4	8	3	7	9	5	9	7	3	9	7
15	3	9	7	9	9	6	9	7	8	9	3	9	9	7	9
16	7	8	9	4	7	9	4	7	4	8	9	3	5	9	5
17	2	5	9	7	5	8	9	9	9	5	9	7	9	6	4
18	9	7	9	9	8	7	6	9	9	5	9	4	9	9	9
19	4	8	7	5	9	9	8	3	4	7	2	9	3	2	4
20	8	4	9	9	3	7	2	9	9	9	5	4	9	9	9
21	7	7	7	7	9	9	9	9	8	6	9	4	7	2	5
22	3	9	9	5	7	3	8	5	6	8	9	9	9	3	2
23	9	8	7	6	5	4	3	2	3	4	5	6	7	8	9
24	4	3	7	4	9	7	9	5	9	4	9	6	9	7	7
25	8	5	9	9	3	9	6	7	8	9	3	9	5	9	4
26	5	8	8	5	9	7	9	3	9	7	9	3	9	2	9
27	5	9	9	4	7	8	4	9	7	9	4	3	5	7	8
28	7	2	7	4	9	3	9	4	9	7	9	8	9	2	5
29	9	6	4	7	8	9	2	7	8	5	9	7	4	7	9
30	2	9	9	3	9	9	4	9	9	6	5	9	9	6	7

Work Series 43 to Series 48.

Addition by Grouping

If the work of the preceding pages has been faithfully done, you are now ready to take an important step toward becoming an expert, rapid calculator. Hitherto your reading of columns of figures has been on the same line almost as reading a page of print by naming the separate letters one after the other. Why not make your figure reading the same as ordinary reading by making convenient combinations of figures? It can be done quite as well with figures as with letters, and if there is any secret about rapid addition it lies in the ability to combine groups of figures at sight.

Our concern will be with groups of two figures each. As you well know, there are only nine digits used in addition. The highest possible result from adding any two of these is 18. We must, therefore, become familiar with all possible combinations of numbers which, in pairs, produce results up to 18. The following table shows what that really means :—

2 (1
(1
3 (1
(2
4 (12
(32
5 (12
(43
6 (123
(543
7 (123
(654

8 (1234
(7654
9 (1234
(8765
10 (12345
(98765
11 (2345
(9876
12 (3456
(9876
13 (456
(987

14 (567
(987
15 (67
(98
16 (78
(98
17 (8
(9
18 (9
(9

Looking over the list we find there are only 45 combinations. These, of course, must be thoroughly memorized. No great task is this; you practically know them now. All we really want is practice at taking in two figures at a glance instead of one.

Here is our plan for practice along this line. While we suggest at the top of the page the figures used, we want you to get the table drill from the page of figures itself. You will notice it is arranged this time in double lines. Suppose you take the first row across the top of the page, as you did the table drill at the top of the preceding pages. That is, slide your pencil along beneath the row and call out the sums of the pairs as you come to them. Come back over the list the same way. Then try the next row. Next run up and down the columns by twos in the same way. Do no carrying of results from one figure to another.

Now you are ready to try the regular addition of a column. Remember you must see in each group of two figures one amount. Bear in mind what we have said about smoothness and regularity in your work. Start slowly, slide the pencil up along the column, name the sums as regularly as the clock ticks. Do not be in a hurry to get away from the easier pages. When you have drilled yourself thoroughly on the first page where the numbers have been blocked out in sets of two for you, try the next page. It contains the same numbers, but you will have to do the grouping with the eye as you run up the columns. Persevere, and don't let yourself fall back to going up one figure at a time.

						2 (1 (1				3 (2 (1					
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	2	1	1	2	2	1	2	1	2	1	1	2	1	1	1
	1	2	1	1	1	2	1	1	1	2	1	1	2	1	2
2	1	2	2	1	2	1	2	2	1	1	2	1	2	1	2
	2	1	1	1	2	2	1	1	2	1	1	2	1	1	1
3	1	1	2	1	2	1	2	2	1	2	1	2	1	2	2
	2	2	1	1	1	2	1	1	1	1	2	1	2	1	1
4	2	2	1	2	1	1	2	2	1	2	1	2	1	2	1
	1	1	2	1	2	1	1	1	2	1	1	1	2	1	2
5	1	2	1	2	1	2	2	1	2	1	2	1	2	1	1
	2	1	2	1	1	1	1	2	1	2	1	1	1	2	1
6	1	1	1	1	1	1	2	1	2	2	2	1	2	1	2
	1	2	1	2	1	2	1	2	1	1	1	2	1	2	1
7	2	2	1	2	2	1	2	1	2	2	1	2	1	2	2
	1	1	2	1	1	2	1	2	1	1	2	1	2	1	1
8	1	2	1	2	1	2	1	2	1	2	2	1	1	1	2
	2	1	1	1	2	1	2	1	2	1	1	2	1	2	1
9	2	1	2	2	1	1	1	2	1	2	1	2	2	1	1
	1	2	1	1	2	2	1	1	2	1	2	1	1	1	2
10	2	2	1	2	1	1	2	1	2	1	2	2	2	2	2
	1	1	1	1	2	2	1	2	1	2	1	1	1	1	1
11	1	2	1	2	1	1	1	2	2	1	2	1	2	2	1
	2	1	2	1	2	2	2	1	1	1	1	2	1	1	2
12	2	1	2		2	1	1	2	1	2	2	1	1	2	2
	1	2	1	2	1	2	2	1	2	1	1	2	2	1	1
13	1	2	1	1	2	2	1	2	1	2	1	2	2	1	2
	2	1	1	1	1	1	2	1	2	1	2	1	1	2	1
14	2	2	2	1	1	1	2	2	1	1	2	1	2	1	2
	1	1	1	2	1	2	1	1	2	2	1	1	1	2	1
15	1	1	2	1	1	2	1	1	2	1	2	1	2	1	1
	2	2	1	2	2	1	2	1	1	2	1	2	1	2	2
16	2	2	1	2	1	2	2	1	1	1	2	1	2	1	1
	1	1	2	1	2	1	1	1	2	2	1	2	1	2	1
17	1	2	1	2	1	2	1	2	1	2	1	2	1	2	2
	2	1	2	1	2	1	2	1	1	1	2	1	2	1	1
18	1	1	2	2	1	2	1	2	1	2	1	2	1	2	1
	2	2	1	1	2	1	2	1	2	1	2	1	2	1	2
19	1	2	2	1	2	1	2	1	2	2	1	2	1	2	2
	2	1	1	2	1	1	1	2	1	1	2	1	2	1	1
20	2	1	2	1	2	2	1	2	1	2	2	1	1	1	2
	1	2	1	1	1	1	2	1	2	1	1	1	2	2	1

2 (1 (1 3 (2 (1

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	2	1	1	2	2	1	2	1	2	1	1	2	1	2	1
2	1	2	1	1	1	2	1	1	1	2	1	1	2	1	2
3	1	2	2	1	2	1	2	2	1	1	2	1	2	1	2
4	2	1	1	1	1	2	1	1	2	1	1	2	1	1	1
5	1	1	2	1	2	1	2	2	1	2	1	2	1	2	2
6	2	2	1	1	1	2	1	1	1	1	2	1	2	1	1
7	2	2	1	2	1	1	2	2	1	2	1	2	1	2	1
8	1	1	2	1	2	1	1	1	2	1	1	1	2	1	2
9	1	2	1	2	1	2	2	1	2	1	2	1	2	1	1
10	2	1	2	1	1	1	1	2	1	2	1	1	1	2	1
11	1	1	1	1	1	1	2	1	2	2	2	1	2	1	2
12	1	2	1	2	1	2	1	2	1	1	1	2	1	2	1
13	2	2	1	2	2	1	2	1	2	2	1	2	1	2	2
14	1	1	2	1	1	2	1	2	1	1	2	1	2	1	1
15	1	2	1	2	1	2	1	2	1	2	2	1	1	1	2
16	2	1	1	1	2	1	2	1	2	1	1	2	1	2	1
17	2	1	2	2	1	1	1	2	1	2	1	2	2	1	1
18	1	2	1	1	2	2	1	1	2	1	2	1	1	1	2
19	2	2	1	2	1	1	2	1	2	1	2	2	2	2	2
20	1	1	1	1	2	2	1	2	1	2	1	1	1	1	1
21	1	2	1	2	1	1	1	2	2	1	2	1	2	2	1
22	2	1	2	1	2	2	2	1	1	1	1	2	1	1	2
23	2	1	2	1	2	1	1	2	1	2	2	1	1	2	2
24	1	2	1	2	1	2	2	1	2	1	1	2	2	1	1
25	1	2	1	1	2	2	1	2	1	2	1	2	2	1	2
26	2	1	1	1	1	1	2	1	2	1	2	1	1	2	1
27	2	2	2	1	1	1	2	2	1	1	2	1	2	1	2
28	1	1	1	2	1	2	1	1	2	2	1	1	1	2	1
29	1	1	2	1	1	2	1	1	2	1	2	1	2	1	1
30	2	2	1	2	2	1	2	1	1	2	1	2	1	2	2

Work Series 49 to Series 54. See page 65

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	3	2	1	2	2	1	3	2	1	3	2	1	3	2	1
	1	2	3	1	2	3	1	1	1	1	2	3	1	1	3
2	2	3	2	1	3	2	1	2	3	2	1	2	1	3	2
	2	1	1	3	1	2	3	2	1	1	2	1	3	1	2
3	1	2	3	1	3	2	3	2	1	2	3	2	1	2	3
	3	1	1	1	1	2	1	1	2	1	1	1	1	2	1
4	3	2	1	2	3	2	1	2	3	1	2	1	3	2	2
	1	1	2	2	1	1	2	2	1	2	2	2	1	1	1
5	2	3	2	1	1	2	2	3	1	1	1	2	2	3	1
	1	1	2	2	3	2	1	1	3	3	2	1	1	2	2
6	1	2	2	1	2	3	3	2	1	2	3	1	2	3	1
	2	2	1	2	2	1	1	1	3	2	1	2	2	1	1
7	1	2	2	1	3	3	1	2	3	2	1	3	1	2	3
	1	2	1	2	1	1	1	1	1	2	3	1	1	1	1
8	2	3	2	1	2	1	3	1	2	3	3	1	2	1	2
	2	1	2	3	2	3	1	3	2	1	1	3	2	2	2
9	2	1	3	1	2	3	2	2	1	2	1	2	3	3	1
	2	3	1	2	2	1	1	2	3	2	3	2	3	1	3
10	2	2	1	2	3	3	1	2	3	2	3	1	1	2	3
	1	2	3	2	1	1	3	2	1	2	1	2	3	2	1
11	1	2	3	1	2	3	1	2	3	1	2	3	2	1	2
	3	2	1	3	1	1	2	1	1	2	1	1	2	3	2
12	1	2	3	1	2	3	3	2	1	2	3	3	1	2	1
	2	2	1	2	2	1	1	2	3	2	1	1	2	1	2
13	1	2	3	3	2	1	2	2	3	1	1	2	3	2	1
	2	2	1	1	2	2	2	1	1	2	2	1	1	2	2
14	2	2	1	3	2	2	3	1	1	2	3	1	2	3	3
	1	2	3	1	1	2	1	2	2	1	1	2	2	1	1
15	1	2		3	2	1	2	2	2	3	1	2	2	3	2
	2	2		1	1	2	2	1	1	1	3	1	2	1	2
16	2	1	3	1	2	3	1	2	2	3	1	1	2	2	1
	2	3	1	2	1	1	3	2	2	1	3	3	2	1	2
17	2	3	1	1	2	3	[illegible]	1	2	3	2	2	3	1	1
	2	1	3	3	1	1	2	3	2	1	1	1	1	2	3
18	2	3	2	1	3	2	2	1	3	2	2	1	1	3	2
	2	1	2	1	1	2	2	3	1	1	2	3	2	1	1
19	2	3	2	1	3	1	2	2	3	1	1	2	2	2	1
	2	1	2	3	1	2	1	2	1	3	3	2	1	2	1
20	3	1	3	2	1	2	2	3	1	3	2	1	2	2	1
	1	2	1	1	3	2	2	1	2	1	1	2	2	1	2

4 (231
(213

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	3	2	1	2	2	1	3	2	1	3	2	1	3	2	1
2	1	2	3	1	2	3	1	1	1	1	2	3	1	1	3
3	2	3	2	1	3	2	1	2	3	2	1	2	1	3	2
4	2	1	1	3	1	2	3	2	1	1	2	1	3	1	2
5	1	2	3	1	3	2	3	2	1	2	3	2	1	2	3
6	3	1	1	1	1	2	1	1	2	1	1	2	1	2	1
7	3	2	1	2	3	2	1	2	3	1	2	1	3	2	2
8	1	1	2	2	1	1	2	2	1	2	2	3	1	1	1
9	2	3	2	1	1	2	2	3	1	1	1	2	2	3	1
10	1	1	2	2	3	2	1	1	3	3	[illegible]	1	1	2	2
11	1	2	2	1	2	3	3	2	3	2	3	3	2	3	1
12	2	2	1	2	2	1	1	1	3	2	1	2	2	1	1
13	1	2	2	1	3	3	1	2	3	2	1	2	1	2	3
14	1	2	1	2	1	1	1	1	1	2	3	1	1	1	1
15	2	3	2	1	2	1	3	1	2	3	3	1	2	1	2
16	2	1	2	3	2	3	1	3	2	1	1	3	2	2	2
17	2	1	3	1	2	3	3	2	1	2	1	2	3	3	1
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29	1	2	3	3	2	1	2	2	2	3	1	2	2	3	2
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5 (2341
(3214

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
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8	4 1	2 2	3 2	1 4	[illegible] 1	2 3	3 1	2 2	3 2	4 1	1 3	2 3	3 1	2 3	1 3
9	4 1	3 2	3 1	1 4	4 1	3 2	2 3	4 1	1 3	3 2	2 2	3 1	2 3	4 1	2 3
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5 (2341
(3214

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4	2	3	4	1	1	1	3	4	2	1	1	3	1	2	2
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11	2	3	2	4	3	1	3	1	2	4	1	3	2	1	4
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19	3	2	1	2	3	4	2	3	4	2	2	3	4	3	2
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6 (12354
(54312

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6 (12354
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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
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4	2	1	2	1	2	4	3	2	5	4	3	1	5	2	3
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6	3	1	2	5	4	4	2	1	3	1	4	1	3	1	5
7	5	2	2	2	4	5	3	1	2	3	1	2	4	5	2
8	1	1	3	4	2	1	1	4	2	3	1	1	2	1	1
9	2	3	2	5	1	3	3	1	1	2	4	1	3	2	4
10	2	1	4	1	3	3	2	3	5	2	2	5	1	2	2
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12	1	1	2	3	4	2	1	2	2	1	1	4	3	1	3
13	3	2	1	2	5	4	3	1	2	4	5	2	3	4	2
14	3	2	4	2	1	2	3	2	3	2	1	2	3	2	2
15	2	5	2	4	1	3	2	2	2	3	1	2	3	2	1
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26	4	3	1	2	4	4	3	1	2	4	2	1	1	1	1
27	3	1	2	1	2	2	1	3	1	2	1	2	[illegible]	2	3
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7 (123654
(654123

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9	4 3	2 3	4 1	3 4	6 1	1 5	2 2	4 2	5 2	1 3	2 5	3 1	4 3	1 3	4 3
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11	2 2	4 3	1 5	2 5	3 3	6 1	2 2	5 2	2 1	3 2	1 1	2 4	6 1	5 1	2 5
12	2 2	6 1	3 1	5 2	2 2	6 1	2 2	3 2	1 2	4 1	2 2	3 4	5 1	3 1	2 5
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15	2 4	3 1	2 4	3 2	1 5	2 3	4 3	1 1	2 4	3 4	3 2	1 4	5 1	3 1	3 4
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7 (123654
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9	2	6	3	5	2	6	2	3	1	4	2	3	5	2	5
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22	2	3	5	5	3	1	2	2	1	2	1	4	1	1	[illegible]
23	2	6	3	5	2	6	2	3	1	4	2	3	5	3	[illegible]
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WORK SERIES 73 TO SERIES 78. See page 66

8 (1234765
(7654123

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19	3 3	4 4	2 6	5 3	6 2	7 1	7 1	2 6	4 4	5 3	3 5	4 4	6 2	3 5	4 4
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(7654123

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15	2	3	4	6	1	5	3	2	4	2	1	3	2	1	3
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17	3	2	1	2	6	3	5	2	1	6	3	4	7	2	4
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19	2	1	7	3	1	4	1	3	5	2	3	1	2	4	1
20	5	4	1	4	5	4	4	2	1	4	3	7	3	4	5
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23	3	2	1	2	3	4	5	3	7	6	3	4	2	3	7
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30	5	4	6	5	4	3	5	4	2	1	4	3	1	2	1

Work Series 79 to Series 84. See page 66

9 (12348765
(87651234

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
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4	4 4	6 3	1 3	2 4	1 7	2 7	1 5	3 4	2 7	3 5	1 7	1 2	2 7	1 6	1 1
5	2 4	1 3	3 6	4 4	3 3	1 6	4 5	1 2	1 5	3 4	1 8	2 4	2 5	2 4	2 2
6	2 7	2 7	1 8	3 6	2 7	3 6	2 7	4 5	3 6	2 7	2 7	3 5	1 3	1 2	7 1
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10	3 1	1 2	2 1	7 3	5 2	3 5	2 3	1 2	5 1	7 5	3 7	2 3	1 2	2 1	5 3
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12	3 6	5 4	7 2	6 3	2 7	3 6	3 6	6 3	7 2	6 3	4 2	5 3	6 3	4 2	4 4
13	2 7	3 6	4 5	5 4	6 3	7 2	8 1	8 1	5 2	4 4	3 3	2 3	2 4	8 1	1 7
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9 (12348765
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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
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7	4	6	1	2	1	2	1	3	2	3	1	1	2	1	1
8	4	3	3	4	7	7	5	4	7	5	7	2	7	6	1
9	2	1	3	4	3	1	4	1	1	3	1	2	2	2	2
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11	2	2	1	3	2	3	2	4	3	2	2	3	1	1	7
12	7	7	8	6	7	6	7	5	6	7	7	5	5	2	1
13	2	4	3	1	2	4	3	2	2	3	1	1	1	2	4
14	5	4	3	6	3	4	4	2	7	5	7	4	8	6	2
15	4	1	3	2	7	1	2	4	5	1	2	1	2	1	3
16	4	2	6	5	2	8	2	4	2	6	3	8	7	1	1
17	3	7	1	3	4	1	2	5	2	8	4	5	1	2	4
18	1	2	7	2	1	5	2	4	1	1	4	2	6	1	4
19	3	1	2	7	5	3	2	1	5	7	3	2	1	2	5
20	1	2	1	3	2	5	3	2	1	5	7	3	2	1	3
21	2	2	4	4	2	4	1	6	1	7	4	2	1	6	2
22	3	4	2	3	7	4	6	3	2	3	5	4	3	5	1
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24	6	4	2	3	7	6	6	3	2	3	2	3	3	2	4
25	2	3	4	5	6	7	8	8	5	4	3	2	2	8	1
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29	3	4	2	6	7	4	8	5	3	3	4	2	3	5	8
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WORK SERIES 85 TO SERIES 90. See page 66

10 (123459876
(987651234

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3	6 4	1 2	1 4	5 5	3 3	3 4	6 2	2 4	3 6	1 3	8 2	1 7	1 5	3 7	4 4
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6	1 5	2 8	3 4	1 6	1 8	1 4	4 6	3 5	1 3	4 4	4 4	2 8	2 5	2 3	4 2
7	4 4	1 9	3 3	3 4	2 7	4 6	3 7	2 5	2 4	4 4	2 3	5 5	3 7	1 2	1 2
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9	4 4	2 8	1 5	2 1	3 3	2 8	1 4	2 6	4 4	5 5	8 2	1 6	7 3	2 4	4 4
10	5 3	9 1	4 6	3 4	7 2	1 6	4 6	5 3	2 5	1 7	2 3	8 2	1 6	5 5	5 5
11	4 5	2 8	5 5	2 5	1 9	8 2	2 2	3 4	7 2	1 7	4 4	2 8	3 5	1 7	4 6
12	2 8	5 5	2 4	5 3	2 1	3 4	8 2	5 2	5 1	2 4	5 5	3 7	1 6	2 8	2 8
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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
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4	5	5	5	5	2	9	3	4	2	7	3	6	4	6	5
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6	4	2	4	5	3	4	2	4	6	3	2	7	5	7	4
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8	4	2	7	5	7	7	3	6	5	4	1	1	3	2	1
9	2	3	6	2	4	5	9	3	1	1	6	2	3	1	6
10	2	7	2	2	6	5	1	4	4	8	8	3	5	8	3
11	1	2	3	1	1	1	4	3	1	4	4	2	2	2	4
12	5	8	4	6	8	4	6	5	3	4	4	8	5	3	2
13	4	1	3	3	2	4	3	2	2	4	2	5	3	1	1
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15	2	1	2	2	3	5	7	5	1	2	3	2	1	4	2
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17	4	2	1	2	3	2	1	2	4	5	8	1	7	2	4
18	4	8	5	1	3	8	4	6	4	5	2	6	3	4	4
19	5	9	4	3	7	1	4	5	2	1	2	8	1	5	5
20	3	1	6	4	2	6	6	3	5	7	3	2	6	5	5
21	4	2	5	2	1	8	2	3	7	1	4	2	3	1	4
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23	2	5	2	5	2	3	8	5	5	2	5	3	1	2	2
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26	2	3	1	4	8	7	8	3	5	2	3	4	7	5	5
27	2	1	3	1	1	2	3	3	4	5	3	2	4	1	7
28	2	2	3	9	6	2	5	3	5	5	6	3	6	6	1
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30	5	5	5	5	2	9	3	4	2	7	3	6	4	6	2

WORK SERIES 91 TO SERIES 96. See page 67

11 (23459876
(98762345

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
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	4	2	3	5	2	4	3	2	2	5	2	4	4	4	7
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	2	1	4	7	2	3	2	1	7	1	2	4	1	3	2
3	2	3	4	4	1	5	2	8	2	6	9	7	6	8	3
	4	2	3	7	1	2	3	4	2	3	5	1	2	1	9
4	4	1	4	2	9	8	8	7	1	4	2	6	8	9	2
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	6	1	3	5	7	4	2	7	1	8	2	1	2	8	6
6	2	7	8	2	3	4	5	4	9	3	7	4	3	7	5
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7	7	8	4	8	8	7	5	6	3	7	6	3	1	2	8
	4	3	2	3	5	1	2	3	1	2	2	4	1	5	7
8	7	5	4	6	2	7	8	6	4	2	9	7	6	2	2
	4	2	5	2	3	2	1	5	2	6	9	4	3	4	1
9	3	7	4	8	5	9	6	5	8	3	1	4	3	7	5
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14	2	3	4	4	1	5	2	8	2	6	9	7	6	8	1
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15	4	1	4	2	9	8	8	7	1	4	2	6	8	9	2
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	6	1	3	5	7	4	2	7	1	8	2	4	8	1	7
17	2	7	8	2	3	4	5	4	9	3	7	4	3	7	2
	4	1	4	2	3	1	2	1	7	4	5	2	1	2	1
18	7	8	4	8	8	7	5	6	3	7	6	3	1	2	3
	4	3	2	3	5	1	2	3	1	2	2	4	1	5	8
19	7	5	4	6	2	7	8	6	4	2	9	7	6	2	3
	4	2	5	2	3	2	1	5	2	6	9	4	2	4	9
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11 (23459876
(98762345

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
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6	2	3	4	4	1	5	2	8	2	6	9	7	6	8	3
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8	4	1	4	2	9	8	8	7	1	4	2	6	8	9	2
9	5	2	4	8	1	6	2	4	2	8	2	1	2	8	4
10	5	3	4	3	7	5	9	4	3	1	4	7	8	3	5
11	6	1	3	5	7	4	2	7	1	8	2	1	2	8	6
12	2	7	8	2	3	4	5	4	9	3	7	4	3	7	5
13	4	1	4	2	3	1	2	1	7	4	5	2	1	2	2
14	7	8	4	8	8	7	5	6	3	7	6	3	1	2	8
15	4	3	2	3	5	1	2	3	1	2	2	4	1	5	7
16	7	5	4	6	2	7	8	6	4	2	9	7	6	2	2
17	4	2	5	2	3	2	1	5	2	6	9	4	3	4	1
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19	5	4	2	8	1	5	4	2	1	3	2	4	8	1	4
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23	4	2	5	1	3	8	1	3	2	5	1	2	5	1	7
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25	4	2	3	5	2	4	3	2	2	5	2	4	4	4	7
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27	2	1	4	7	2	3	2	1	7	1	2	4	1	3	8
28	2	3	4	4	1	5	2	8	2	6	9	7	6	8	1
29	4	2	3	7	1	2	3	4	2	3	5	1	2	1	9
30	4	1	4	2	9	8	8	7	1	4	2	6	8	9	2

WORK SERIES 97 TO SERIES 102. See page 67

12 (3456987
(9876345

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2	4 2	9 3	1 8	2 6	1 7	4 5	1 7	2 9	4 3	2 1	8 4	2 2	4 3	6 6	8 4
3	1 7	4 8	2 7	1 6	4 4	7 5	2 3	1 6	2 9	3 2	4 1	5 7	2 4	1 1	1 9
4	4 4	2 1	8 2	5 7	1 6	2 2	9 3	2 4	5 5	2 1	3 4	7 5	2 3	1 5	6 5
5	2 4	8 4	1 7	2 2	1 3	2 7	4 4	5 7	3 8	9 2	1 4	4 4	2 6	7 1	8 3
6	3 1	2 8	4 5	7 5	3 7	5 7	2 1	3 4	7 5	2 1	3 2	8 4	5 2	6 6	7 5
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8	4 2	1 7	2 2	3 2	8 4	2 1	5 5	3 9	4 2	1 6	7 3	2 8	1 4	2 2	1 6
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11	2 2	1 1	4 4	2 8	4 6	1 7	4 2	8 4	2 2	1 7	8 4	2 9	1 8	2 7	7 4
12	4 2	3 1	8 4	1 6	4 4	7 5	2 6	4 3	7 5	1 7	4 2	1 6	6 6	4 6	6 4
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14	4 4	2 1	3 3	4 5	2 7	4 4	3 6	5 7	1 2	9 3	7 7	1 6	2 8	1 3	4 4
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16	1 7	4 8	2 7	1 6	4 4	7 5	2 3	1 6	2 9	3 2	4 1	5 7	2 4	1 1	1 6
17	4 4	2 1	8 2	5 7	1 6	2 2	9 3	2 4	5 5	2 1	3 4	7 5	2 3	1 5	7 5
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19	3 1	2 8	4 5	7 5	3 7	5 7	2 1	3 4	7 5	2 1	3 2	8 4	5 2	6 6	1 2
20	2 7	1 6	5 2	1 3	4 4	2 5	8 4	2 9	5 3	4 8	2 7	1 6	2 2	1 4	7 3

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(9876345

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
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11	3	2	4	7	3	5	2	3	7	2	3	8	5	6	7
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27	4	2	3	4	2	4	3	5	1	9	7	1	2	1	4
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29	4	9	1	2	1	4	1	2	4	2	8	2	4	6	8
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WORK SERIES 103 TO SERIES 108. See page 67

13 (456987
(987456

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
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19	3 3	4 4	2 1	4 4	5 1	4 9	2 6	1 7	4 4	3 2	7 6	5 5	4 9	1 8	7 6
20															

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(987456

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
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13	3	4	2	4	5	4	2	1	4	3	7	5	4	1	9
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15	4	7	4	2	1	6	2	4	1	6	4	7	2	4	3
16	8	5	4	7	8	4	2	9	1	7	2	1	3	4	2
17	5	1	2	1	4	2	8	1	[illegible]	4	4	2	4	1	4
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19	4	2	1	3	4	8	5	6	2	4	5	6	4	4	5
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29	2	4	5	1	7	1	9	1	3	2	1	2	5	1	2
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14 (56798
(98756

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
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11	7 2	8 4	2 7	4 5	2 1	3 6	5 2	7 4	2 9	4 5	6 1	7 7	2 3	4 5	7 7
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19	8 2	1 6	7 5	4 4	8 1	2 5	9 7	1 6	2 2	4 4	1 8	6 8	2 9	1 4	2 9
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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
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6	7	6	2	6	4	7	2	1	5	4	5	2	7	2	2
7	4	2	3	1	2	1	2	5	9	2	1	7	2	1	6
8	8	9	7	6	7	1	8	5	5	2	4	3	4	5	7
9	7	1	8	2	1	9	2	3	2	1	2	5	6	7	8
10	2	4	3	8	5	5	2	4	5	7	9	5	4	7	6
11	8	1	7	4	8	2	9	1	2	4	1	6	2	1	7
12	2	6	5	4	1	5	7	6	2	4	7	8	9	4	7
13	2	7	2	9	1	8	2	4	6	1	2	3	4	6	4
14	8	7	4	5	7	6	2	8	8	7	9	5	2	1	4
15	7	2	4	1	8	2	9	1	2	7	2	4	7	2	9
16	7	9	2	6	4	1	5	3	7	7	1	8	7	6	5
17	1	8	7	2	4	8	1	8	1	8	9	1	3	5	2
18	1	2	[illegible]	6	2	6	4	2	2	1	5	2	4	6	1
19	2	1	4	8	5	2	4	7	3	4	8	1	9	2	4
20	8	7	2	6	5	9	4	1	7	4	2	7	5	2	3
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27	4	1	4	2	8	2	4	5	2	4	2	5	1	7	4
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15 (6798
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3	4 7	1 6	2 5	6 4	2 8	5 5	2 9	1 6	2 3	7 8	1 4	2 9	5 8	7 8	9 6
4	4 4	1 7	2 8	7 5	2 9	8 3	2 4	1 7	2 2	4 4	1 5	8 6	7 2	1 3	1 2
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10	2 2	1 6	7 5	4 5	9 7	6 9	2 2	4 8	6 9	5 4	2 9	8 4	6 1	7 3	1 8
11	4 8	2 1	3 7	2 5	4 4	8 2	1 6	2 8	5 5	4 4	8 7	8 5	2 9	1 1	4 4
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14	4 4	2 2	1 6	7 8	2 5	4 9	5 4	2 6	6 9	3 4	7 8	1 4	2 5	6 1	9 6
15	2 2	6 9	7 1	2 2	7 8	1 4	2 2	4 6	2 1	2 7	7 1	5 4	9 5	4 2	2 4
16	4 7	1 6	2 5	6 4	2 8	5 5	2 9	1 6	2 3	7 8	1 4	2 9	5 8	7 8	8 5
17	4 4	1 7	2 8	7 5	2 9	8 3	2 4	1 7	2 2	4 4	1 5	8 6	7 2	1 3	9 1
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19	5 5	2 4	8 6	7 7	2 1	6 4	8 2	2 4	4 5	8 6	2 4	6 5	1 8	2 2	8 4
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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
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6	7	6	5	4	8	5	9	6	3	8	4	9	8	8	6
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WORK SERIES 121 TO SERIES 126. See page 68

16 (789
(987

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
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17	4 3	2 5	1 9	2 8	4 4	7 9	2 5	4 6	1 1	2 2	8 8	4 7	2 4	8 6	9 7
18	7 7	4 4	1 9	2 8	4 4	1 9	4 2	5 7	2 4	8 6	1 7	5 9	4 8	8 8	8 2
19	2 4	7 7	1 6	5 2	7 1	2 8	8 8	7 4	6 1	9 5	7 9	8 8	4 2	1 6	4 1
20	7 2	1 4	7 9	2 4	8 8	1 6	5 4	8 2	7 9	1 6	4 4	7 1	2 8	7 4	8 2

16 (789
(987

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	4	2	7	2	1	8	4	1	9	4	1	2	4	7	7
2	4	1	8	5	6	8	7	2	5	9	7	9	3	1	2
3	2	4	1	2	8	1	4	2	3	2	7	4	2	8	1
4	8	6	9	7	8	5	9	8	1	2	9	7	1	8	9
5	4	2	1	2	7	4	1	6	9	7	2	6	2	8	4
6	4	8	7	5	7	4	8	4	1	9	4	7	2	4	4
7	4	2	1	2	4	7	2	4	1	2	8	4	2	8	8
8	3	5	9	8	4	9	5	6	1	2	8	7	4	6	2
9	7	4	1	2	4	1	4	5	2	8	1	5	4	8	9
10	7	4	9	8	4	9	2	7	4	6	7	9	8	8	7
11	2	7	1	5	7	2	8	7	6	9	7	8	4	1	2
12	4	7	6	2	1	8	8	4	1	5	9	8	2	6	4
13	7		7	2	8	1	5	8	7	1	4	7	2	7	8
14	2	4	9	4	8	6	4	2	9	6	4	1	8	4	8
15	1	4	2	8	1	9	4	5	1	7	4	8	1	4	4
16	9	7	2	8	4	7	6	2	1	9	6	2	7	8	4
17	4	2	7	4	8	1	3	7	5	4	2	8	7	4	2
18	8	2	9	5	8	2	1	9	5	7	6	1	9	5	8
19	4	2	4	5	2	4	5	8	3	7	5	7	4	1	8
20	6	2	1	5	2	8	6	2	4	1	4	8	2	6	7
21	2	4	1	2	8	2	1	5	7	8	5	7	8	9	6
22	2	4	1	7	4	9	6	2	1	4	1	4	2	6	4
23	4	2	4	1	2	8	7	4	1	7	4	8	9	2	9
24	8	9	6	7	2	4	9	5	6	8	4	5	1	2	5
25	2	1	7	4	8	7	1	5	4	7	1	8	8	7	9
26	8	6	9	4	8	9	6	9	8	2	6	4	8	9	1
27	4	2	1	2	7	4	1	6	9	7	2	6	2	8	6
28	4	8	7	5	7	4	8	4	1	9	4	7	2	4	6
29	4	2	1	2	4	7	2	4	1	2	8	4	2	8	9
30	3	5	9	8	4	9	5	6	1	2	8	7	4	6	7

WORK SERIES 127 TO SERIES 132. See page 68

	A	B	C	D	E	F	G 17 (89 (98	H	I 18 (9 (9	J	K	L	M	N	(
1	2 4	6 1	8 9	4 4	7 9	4 2	8 6	2 1	7 3	1 1	4 4	8 2	5 5	1 1	2 4
2	2 2	4 1	7 9	8 4	5 5	9 9	4 4	8 8	2 3	4 4	1 6	7 8	2 5	1 8	9 9
3	4 4	8 4	2 5	1 6	9 9	2 1	8 9	4 4	7 8	1 6	2 3	4 4	7 8	1 6	8 8
4	7 5	4 9	5 1	2 6	8 4	7 7	2 9	4 7	1 1	2 2	4 4	7 3	8 1	9 9	6 4
5	4 5	8 2	1 6	8 8	6 5	4 1	2 2	9 8	4 8	7 1	8 9	2 1	7 2	1 1	9 1
6	2 4	7 1	8 6	7 7	4 2	1 6	8 9	7 1	9 9	4 8	1 2	9 7	1 6	9 9	9 9
7	7 8	7 7	4 4	2 8	1 6	8 9	2 1	9 9	4 7	2 8	8 9	4 2	1 6	5 9	4 8
8	8 4	1 9	2 7	4 9	9 9	4 8	2 1	3 3	4 2	9 8	1 1	7 8	4 6	2 1	6 3
9	5 5	2 1	7 8	1 7	9 9	4 4	2 2	4 4	8 4	1 6	9 9	4 8	7 1	2 4	8 9
10	6 8	2 7	1 6	8 9	4 9	5 7	2 1	4 4	7 8	6 5	4 4	7 9	1 2	6 8	4 4
11	7 5	8 2	1 7	8 2	9 1	2 2	8 9	9 9	7 4	2 8	6 1	7 7	4 4	2 2	7 8
12	7 7	2 1	4 5	3 4	7 7	4 4	6 1	2 2	4 7	1 6	5 9	4 7	8 2	1 7	2 9
13	2 8	7 5	4 4	1 6	5 9	4 4	1 8	2 2	6 5	1 4	2 9	5 6	7 8	4 4	4 6
14	2 4	6 1	8 9	4 4	7 9	4 2	8 6	2 1	7 3	1 1	4 4	8 2	5 5	1 1	8 8
15	2 2	4 1	7 9	8 4	5 5	9 9	4 4	8 8	2 3	4 4	1 6	7 8	2 5	1 8	9 9
16	4 4	8 4	2 5	1 6	9 9	2 1	8 9	4 4	7 8	1 6	2 8	4 4	7 8	1 6	4 4
17	7 5	4 9	5 1	2 6	8 4	7 7	2 9	4 7	1 1	2 2	4 4	7 3	8 1	9 9	2 8
18	4 5	8 2	1 6	8 8	6 5	4 1	2 2	9 8	4 8	7 1	8 9	2 1	7 2	1 1	4 6
19	2 4	7 1	8 6	7 7	4 2	1 6	8 9	7 1	9 9	4 8	1 2	9 7	1 6	9 9	9 7
20	2 8	7 7	4 4	2 8	1 6	8 9	2 1	9 9	4 7	2 8	8 9	4 2	1 6	5 9	8 4

17 (98 (89 18 (9 (9

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	2	6	8	4	7	4	8	2	7	1	4	8	5	1	2
2	4	1	9	4	9	2	6	1	3	1	4	2	5	1	4
3	2	4	7	8	5	9	4	8	2	4	1	7	2	1	9
4	2	1	9	4	5	9	4	8	3	4	6	8	5	8	9
5	4	8	2	1	9	2	8	4	7	1	2	4	7	1	8
6	4	4	5	6	9	1	9	4	8	6	8	4	8	6	8
7	7	4	5	2	8	7	2	4	1	2	4	7	8	9	6
8	5	9	1	6	4	7	9	7	1	2	4	3	1	9	4
9	4	8	1	8	6	4	2	9	4	7	8	2	7	1	9
10	5	2	6	8	5	1	2	8	3	1	9	1	2	1	1
11	2	7	8	7	4	1	8	7	9	4	1	9	1	9	9
12	4	1	6	7	2	6	9	1	9	8	2	7	6	9	9
13	7	7	4	2	1	8	2	9	4	2	8	4	1	5	4
14	8	7	4	8	6	9	1	9	7	8	9	2	6	9	8
15	8	1	2	4	9	4	2	3	4	9	1	7	4	2	6
16	4	9	7	9	9	8	1	3	2	8	1	8	6	1	3
17	5	2	7	1	9	4	2	4	8	1	9	4	7	2	8
18	5	1	8	7	9	4	2	4	4	6	9	8	1	4	9
19	6	2	1	8	4	5	2	4	7	6	4	7	1	6	4
20	8	7	6	9	9	7	1	4	8	5	4	9	2	8	4
21	7	8	1	8	9	2	8	9	7	2	6	7	4	2	7
22	5	2	7	2	1	2	9	9	4	8	1	7	4	2	8
23	7	2	4	8	7	4	6	2	4	1	5	4	8	1	2
24	7	1	5	4	7	4	1	2	7	6	9	7	2	7	9
25	2	7	4	1	5	4	1	2	6	1	2	5	7	4	4
26	8	5	4	6	9	4	8	2	5	4	9	6	8	4	6
27	2	6	8	4	7	4	8	2	7	1	4	8	5	1	8
28	4	1	9	4	9	2	6	1	3	1	4	2	5	1	8
29	2	4	7	8	5	9	4	8	2	4	1	7	2	1	9
30	2	1	9	4	5	9	4	8	3	4	6	8	5	8	9

WORK SERIES 133 TO SERIES 138. See page 68

Two Column Addition

In adding two columns at once, group the tens first, and then the units. Thus, in adding 85 and 34, think of 115 (85 + 30) and 4 or 119. The following question is worked out in detail to further illustrate this process.

Beginning with the number 82 we proceed as follows :—

75	
81	82 + 70 = 152 ; 152 + 6 = 158
24	158 + 20 = 178 ; 178 + 4 = 182
76	182 + 80 = 262 ; 262 + 1 = 263
82	263 + 70 = 333 ; 333 + 5 = 338
338	

As in all the previous work, aim at reading. Name results only. Thus, the reading for the columns just added would read as follows :—

152, 158, 178, 182, 262, 263, 333, 338.

For practice in this line of addition, any of the preceding pages, or the questions blocked out on them may be used equally as well for two column work as for single column work. We believe, however, that the average individual has his hands full in learning to add one column at a time, and do not advocate putting any time on this work unless one has become very expert at the simpler work.

Horizontal Addition

When numbers are written in horizontal lines, as in the case of invoice and other business forms, they should be added as they stand. Add from right to left and prove by adding from the left to right.

Horizontal addition becomes a necessity in a great many forms of tabular statement required in different places, as the following examples will show.

Series 138a

Complete the following tables by showing the totals of the columns, vertically and horizontally. Prove the work by adding the vertical and horizontal totals.

1. DEPARTMENTAL SALES FOR THE WEEK ENDING NOV. 15, 1906

DAYS	CLOTHING	DRY GOODS	FURNISHINGS	MILLINERY	HOUSEHOLD UTENSILS	TOTAL
Monday	$790 50	$988 40	$126 50	$256 85	$496 80	
Tuesday	640 18	890 50	90 18	420 62	841 62	
Wednesday	960 70	950 40	75 60	398 40	462 50	
Thursday	490 18	960 80	214 90	425 60	521 90	
Friday	930 50	720 50	126 70	396 80	762 80	
Saturday	840 15	989 72	215 20	459 65	925 54	
Total						

2. MONTHLY AND YEARLY STATEMENT

MONTH	1900	1901	1902	1903	1904	Totals
January	124832	345325	784395	528349	112233	
February	728941	167832	286948	956873	668734	
March	325768	589435	758586	424632	297865	
April	924876	654321	321476	594657	192843	
May	543768	234567	592763	294632	765345	
June	928328	891234	198725	528647	294763	
July	764732	567895	539876	328943	348694	
August	654924	438927	247632	294742	728643	
September	628328	624932	586529	486532	387544	
October	784623	864743	738564	674384	867347	
November	398472	157635	328924	586432	247689	
December	153287	594765	895855	975683	348789	
Totals						

3. Grain Export of a City for One Week (in bushels)

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Totals
Corn	28325	15236	35715	29128	75183	46217	
Wheat	35719	41719	50108	32546	59275	81126	
Oats	12136	9237	18265	7268	6950	17230	
Barley	18230	15738	21375	15928	19263	13637	
Rye	5275	6829	7201	11325	7825	13261	
Totals							

4. School Attendance

School	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
1st Ward	1126	1010	987	928	1097	1065	989	1074	994	917	
2nd "	1049	984	946	898	1036	978	943	960	917	889	
3rd "	876	807	758	716	847	827	810	864	793	719	
4th "	948	892	868	807	849	808	796	757	714	658	
5th "	1075	1043	985	924	1019	981	967	1007	947	939	
6th "	829	757	749	717	837	806	795	801	824	783	
7th "	743	704	685	612	728	694	709	716	697	651	
8th "	843	807	784	757	838	816	824	775	786	727	
Totals											

TO THE TEACHER

An unlimited amount of practice along this line may be given from any of the addition pages. As each page has fifteen columns, we may divide any one of them into 5 lists 3 columns wide, or into 3 lists 5 columns wide. The questions may be arranged at any length within the compass of the page. If it is not desired to make the lists contain an even number of columns, a greater variety of questions may be given from any one page.

Proving Addition

The simplest way to prove addition is to add the columns in reverse order, that is, if they have been added from bottom to top, prove by adding from top to bottom.

Where very long columns are to be added, or where work is subject to interruptions, it is advisable to add each column by itself without carrying from one to the other. Place the totals of the different columns, one beneath the other, on a piece of scribbling paper, and then find the sum of these totals. If it is desired to prove this work, after adding the columns from the right to the left in the usual way, start with the left hand columns and add from top to bottom, placing the total of each column on a scribbling paper, as before. If the results are the same the work may be taken as correct.

Illustration :

```
  21          7485         25
   34         2917        25
    25        3524       34
     25       4781      21
  -----       5968     -----
  24675       ----     24675
             24675
```

Solution :

Commence with the right hand column and add from the bottom to the top. Set the total 25 to one side on a piece of scribbling paper. Without carrying, find the total of the next column, 25, and place it beneath the first total, and so on with each column. The sum of these totals is 24675.

Proof :

Commence with the left hand column and add from the top to the bottom. Set the total, 21, to one side. Under this place the total of the next column, 34, and so on. Find the sum of these totals. This sum being the same as that found by the first addition, the work may be taken as correct

Proof by Casting Out of 9's

This method of proof is based on the fact that any number divided by 9 will leave the same remainder as the sum of its digits divided by 9.

To illustrate this, let us take the number 4785

$$4785 = \begin{cases} 4000=4\ (1000)=4\ (999+1)=4\times 999+4. \\ 700=7\ (\ 100)=7\ (\ 99+1)=7\times\ 99+7. \\ 80=8\ (\ \ 10)=8\ (\ \ 9+1)=8\times\ \ 9+8. \\ 5=5\ \ \ \ =5\ \ \ \ =\ \ \ \ 5. \end{cases}$$

From this analysis it will be seen that 4785 may be written :—

$$4\times 999+7\times 99+8\times 9+4+7+8+5.$$

When written in this form it will be seen that the only remainder that can come from a division of the number by nine will come from a division of 4 + 7 + 8 + 5 by nine, that is, from a division of the sum of the digits by nine.

Proof for Addition—

Cast the nines out of the addends, also cast the nines out of the sum. If the excesses agree the work is correct.

OPERATION

		Sum of Digits.		Casting out 9's leaves.
27643	=	22	=	4
54741	=	21	=	3
97814	=	29	=	2
36329	=	23	=	5
92554	=	25	=	7
98929	=	37	=	1
408010		$9 \mid \underline{13}$ 1-4		$9 \mid \underline{22}$ 2-4

Rule for Casting Out 11's

Begin with the right hand figure, and find the sum of the digits in the odd places. Next find the sum of the digits in the even places. Subtract the sum of the figures in the even places from the sum of the figures in the odd places. If the sum of the figures in the even places is the greater, add 11, or a multiple of 11, to the sum of the figures in the odd places and then subtract. The result, if less than 11, is the excess of 11's. If the result is greater than 11, subtract the tens from the units and the remainder is the excess.

ILLUSTRATION

	Sum of figures in odd places.	Sum of figures in even places.		Excess
48426	14	10	4	
17532	8 (+11)	10	9	13=2
65958	23	10		13=2

The excess being 2 in both places, the work is taken to be correct.

The Check Figure System of Proving Posting to Ledger.

The illustration we have given of the proving of addition by the casting out of nines, or of elevens, will also explain the Check Figure System of proving posting

To illustrate this particular application of these proofs we show the posting of several items from a Sales Book to a Ledger.

SALES BOOK. **PAGE 69.**

Date.	Names.	Fo.	Check.	Amts.	
1906 Oct. 14	W. McIntosh	84	9	124	72
"	J. M. Fraser	84	2	148	96
"	S. J. Stubbs	84	6	14	14
"	W. Miller	84	8	43	20
			3	331	02

LEDGER **PAGE 84.**

DR. **W. McINTOSH** **CR.**

1906		Fo	Check.			1906			Fo.	Check.	
Oct. 14	S. B.	69	9	124	72						

J. M. FRASER

Oct 14	S. B.	69	2	148	96						

S. J. STUBBS

Oct. 14	S. B.	69	6	14	14						

W. MILLER

Oct. 14	S. B.	69	8	43	20						

Explanation—

The check figure employed is 11. Both the Sales Book and the Ledger are provided with columns for the extension of the check figure. As each entry is made the check figure is placed, in its column, beside the amount. The first check that is given upon the work is when the Sales Book is posted. The total is proved to be correct, as we have shown any simple addition may be proved, by comparing the check figure of the total with the sum of the check figures of the different addends.

The next check that the system affords is on the posting. As each item is posted to the Ledger, the check figure is placed as illustrated. The check figures of the Ledger must then correspond with check figures of the Sales Book. Instead of adding the total of the amounts posted to the Ledger, the work is tested by simply adding the check figures.

The same operation will prove the posting from the Cash Book, Journal, Purchase Book, or any other book, so that the bookkeeper may prove his work day by day as he goes along.

The check figure is not infallible. Mistakes may be made in extending it, and there are some mistakes it will not check. For example, the check figure 11 will not detect the mistake of posting, $45.10, as $10.45. Different bookkeepers pin their faith to different check figures, 9, 11, 13 or 19, according as they judge them to best measure up to the standard of an accurate proof. The working plan for all of them is practically the same.

Rapid Subtraction

The greatest foe to rapidity in subtraction will be found in the great amount of unnecessary talking or thinking that very often accompanies the operation. You have doubtless heard a child at a question in subtraction go over such a rhyme as this: "Four from two you can't, borrow one and make the two twelve. Then four from twelve leaves eight," and so on. Bad habits once learned are hard to get rid of. What the child does the grown up person is also likely to do. Perhaps some of the rhyme is dropped but we must get rid of it all. In short, we want to be able to call out the differences between numbers just as readily as the sums of them.

With the idea of acquiring fluency in this work of naming differences we suggest on this page a series of drills to be practiced in the same manner as were the addition drills. That is, slide a pencil along under the row and call off the differences. Resist every temptation to say or think 2 from 9 leaves 7, 2 from 8 leaves 6, but call them out 7, 6, 5, and so on. When you have drilled thoroughly in this way reverse the process by subtracting the top figures from the bottom ones. This time you have to imagine the bottom rows as being 12, 13, 14, etc., instead of 2, 3, 4, etc. Thus gradually the idea of "borrowing" is worked in, but remember, no talking over it. Say your results as before, sharply and regularly.

We place no special pages of subtraction at your disposal for the reason that any one of the addition pages will afford you sufficient practice. You can easily slide a paper up beneath any row of figures and on it jot down the result of a subtraction from the row above it.

The following are the drills suggested :—

4,	7,	3,	9,	2,	5,	10,	8,	11,	6,
2	2	2	2	2	2	2	2	2	2
9,	7,	3,	12,	6,	4,	11,	5,	10,	8,
3	3	3	3	3	3	3	3	3	3
8,	10,	4,	6,	11,	7,	9,	13,	5,	12,
4	4	4	4	4	4	4	4	4	4
8,	14,	5,	7,	6,	10,	12,	11,	9,	13,
5	5	5	5	5	5	5	5	5	5
12,	9,	8,	6,	14,	10,	13,	11,	15,	7,
6	6	6	6	6	6	6	6	6	6
13,	10,	7,	9,	16,	11,	8,	12,	14,	15,
7	7	7	7	7	7	7	7	7	7
14,	11,	8,	13,	10,	9,	17,	12,	16,	15,
8	8	8	8	8	8	8	8	8	8
12,	16,	13,	9,	11,	18,	10,	15,	14,	17,
9	9	9	9	9	9	9	9	9	9

Proof for Subtraction

Add the remainder and subtrahend, and if the sum is equal to the minuend, the work is correct.

Proof by casting out 9's.—Cast the 9's out of the minuend, also cast the 9's out of the subtrahend and remainder; if the excesses agree, the result is correct.

Short Methods in Subtraction

Very often the bookkeeper is required to take the sum of several numbers from a certain number, or to take the sum of several numbers from the sum of several other numbers, without transferring totals to another paper. The following illustrations will show how such work is done.

Question.—From 38295 subtract the sum of 4175, 2849, 5473, and 6284.

Solution.

```
38295
-----
 4175
 2849
 5473
 6284
-----
19514
```

For convenience in getting a grasp of the idea, arrange the figures as shown, with the figures of the subtrahend beneath the figures of the minuend, and separated from them by a line.

Find the sum of the units column of the subtrahend, 21. 21 cannot be subtracted from 5 (the units figure of the minuend) unless we "borrow" two 10's and make the amount 25. 21 from 25 leaves 4, the first figure in our result.

Find the sum of the figures in the ten's column, 26. Add to this the two ten's borrowed, making 28. 28 cannot be subtracted from 9 (the ten's figure of the minuend) unless we " borrow " two 100's and make the amount 29. 28 from 29 leaves 1, the second figure in our result.

Find the sum of the figures in the hundreds column, 15. Add to this the 2 hundreds that were borrowed, making 17. To subtract 17 from 2 " borrow " 2 thousand, making 22. 17 from 22 leaves 5, the next figure of the result.

Proceed in the same manner with the rest of the columns.

Question.—From the sum of 2712, 4506, 2923 and 4715, subtract the sum of 179, 287, 396 and 477.

Solution.

2712
4506
2923
4715

179
287
396
477

13517

Find the sum of the units of the subtrahend, 29. Find the sum of the units of the minuend, 16. 29 cannot be taken from 16 unless we " borrow " two tens making the amount 36. 29 from 36 leaves 7, the first figure of the result.

Find the sum of the tens of the subtrahend, 31. To this add the two tens that we "borrowed," making 33. Find the sum of the tens of the minuend, 4. 33 cannot be subtracted from 4, unless we " borrow " three hundreds, making 34. 33 from 34 leaves 1, the second figure of the result.

Proceed in this manner with the other columns.

Examples for Practice

Series 138 (b)

(1). Find the net weight of 4 tubs of lard, 63 – 14, 70 – 15, 71 – [illegible], [illegible] – 14.

Note—In billing, the above numbers are written horizontally as shown. The first number of each pair stands for the gross weight and the second number for the allowance for weight of tub. The net weight should be found without re-writing the numbers.

(2). Find the net weight of 6 baskets of pork loins, 315 – 48, 312 – 57, 289 – 44, 425 – 51, 341 – 52, 315 – 56.

(3). Find the net weight of 10 casks of hams, 426 – 67, 395 – 70, 398 – 64, 400 – 69, 424 – 71, 409 – 67, 412 – 66, 402 – 71, 411 – 71, 398 – 68.

(4). Find the net weight of 8 casks of shoulders, 352 – 24, 317 – 21, 316 – 18, 314 – 18, 311 – 17, 326 – 19, 322 – 21, 428 – 19.

Find the balances of the following accounts, without using pen or pencil for anything more than the writing of the results.

(5).

DR. P. McINTOSH CR.

1906			1906		
January 4		$1,274 75	January 9		$375 00
" 18		378 50	" 31		579 23

(6). A. F. SPROTT

1906			1906		
January 1		$2,000 00	January 2		$55 00
" 5		190 25	" 4		523 80
" 13		201 75	" 11		178 75
" 26		169 25	" 25		235 00
			" 31		40 00

(7). H. T. GOUGH

1906.			1906.		
January 4		$523 80	January 5		$190 25
" 6		235 00	" 8		169 25
" 11		198 75	" 13		201 75
" 17		228 75	" 22		153 25
" 27		57 00	" 29		82 00

(8). E. WARNER

1906.			1906.		
January 7		$1,508 70	January 31		$285 75
" 14		608 00			
" 22		235 25			

(9). JAMES HUNTER

1906.			1906.		
January 5		$475 80	January 6		$400 00
" 12		94 84	" 25		75 98
" 19		17 27	" 31		15 00

Find the balances of the following accounts. Use the pencil in writing answers only.

(10). Balance in bank, Aug. 1, $422.15.
Checks for Aug., $25.00, $14.90, $7.87, $46.50, $8.50.

(11). Balance in bank, July 1, $7.087.95.
Checks for July, $298.68, $50.00, $86.25, $579.59, $246.89.

(12). Balance in bank, Aug. 1, $7,232.61.
Checks for Aug., $51.54, $845.27, $91,42, $300, $1,260.

(13). Balance in bank, September 1, $4,722.67.
Checks for September, $79.97, $94.00, $954.89, $67.87, $107.60, $218.27.

Rapid Multiplication

To the Student

The ability to multiply rapidly depends upon a thorough knowledge of the multiplication tables combined with an ability to add rapidly. Knowledge of the multiplication tables means ability to take a string of figures and read, without any hesitation, the products by any number from at least two to twelve. When we first learned these tables we learned them in regular order, twice 2 are 4, twice 3 are 6, and so on. Good enough for a start, but we want them better now. For that reason we suggest at the top of the succeeding pages a practice something like that which preceded your first pages in addition. This time, instead of sums, name products. Remember all the points about smoothness and regularity.

Of course, beside the multiplying, there is also the adding required in carrying. This should not bother one who can add rapidly, but if you require a little practice in this we can systematize it as follows: All the carrying figures in ordinary multiplication are 1, 2, 3, 4, 5, 6, 7, 8, 9. All the possible products of two figures are: 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, 24, 25, 27, 28, 30, 32, 35, 36, 40, 42, 45, 48, 49, 54, 56, 63, 64, 72, 81. Take the carrying figures in turn and go over the product figures naming the sums as you did in the drills on addition tables.

You will find it almost as easy to multiply by any double figure from 13 to 19 as to multiply by the single figures. That is, multiplying by 13 is very little harder than multiplying by 3, and so on. A study of a short multiplication worked out in two lines will show you why this is so.

```
 4725
   13
-----
14175
4725
-----
61425
```

You will see that the second line just makes a second addition to the usual carrying that is done. To shorten the work we must carry this extra addition in the head instead of setting it down, or we might state the rule thus: $3 \times 5 = 15$. $3 \times 2 + 1 + 5 = 12$. $3 \times 7 + 1 + 2 = 24$. $3 \times 4 + 2 + 7 = 21$. $4 + 2 = 6$. Along with your practice on three therefore, you might try multiplying by 13 and so on up the list.

The complete list of drills that may be practiced as an introduction to either line of multiplication is as follows:

Multiplication Drills

(Using page 54 for example)

(1). Drill on the table at the top of the page, *i.e.*, multiply each figure in the top row by 2. Metronome 84 to 144.

(2). Give the same drill on any of the thirty rows on the page or up and down any of the columns. Metronome 84 to 144.

(3). Drill on the multiplication table combining with it the idea of "carrying"; that is, fix the attention on two lines, say 9 and 10, start by calling out the product of the first figure in line 10 and next the addition of the figure in line 9 immediately above. Proceed in this manner across the page. Metronome 120 to 160. (Drop one count between each pair.)

(4). Drill on actual multiplication. Start at the right side of any row and call out the figures just as they would be required if we were setting down the multiplication of the line by 2. Metronome 46 to 72.

(5). Drill on the work required in multiplying by any number from 13 to 19. This will be the same as in No. 3 drill with the exception that instead of adding the figures of one line, above the one multiplied, we take in two. Metronome 120 to 160.

In taking hold of a series of questions for actual multiplication you will find that the indications are given in the same way as in addition work. Thus on page 54 the indication

5 - 9 - A - D

would block out the figures:

377
845
139
368

In this work we do not treat these figures as being amounts to be added but rather as so many items in a bill, each one to be multiplied by 2 thus:

$$\begin{array}{r} 377 \times 2 = 754 \\ 845 \times 2 = 1690 \\ 139 \times 2 = 278 \\ 368 \times 2 = 736 \\ \hline 3458 \end{array}$$

To prepare foolscap for this work proceed as follows: Select a whole sheet of paper and with your pencil draw two lines from the top of the page to the bottom in such a way as to divide the page into three columns of equal width. Next give the paper two folds along these ruled lines so that you now have the sheet folded to one-third its former width. Then when you block out your questions use this folded sheet as a right-hand marker, placing it right beside the question blocked out, and proceed to extend the different amounts. When you fill one column on the page of foolscap turn the paper over and you have the second column just as handy.

When you have finished a series by 3 you might try a series by 13. Then you might try a series by 3⅓ and 33⅓, which will involve division by 3 (see short rules, page 74). In the same way you may, after multiplying a series by 4, try a series by 14 and next a series by 2½ and by 25, which involves division by 4. In this way you may continue through the whole list of digits.

Now as with addition you require practice. We are trying to give you a systematic course of practice, but the work is with you. Never mind worrying about short rules for multiplication. True, there are many rules. To multiply by 37½, for instance, we annex two ciphers, multiply by 3, and divide by 8, but of what use is this rule to you if you are slow in multiplying by 3, or in dividing by 8? And so it is with all of them. While they may save you some work, what is left is still of the old-fashioned kind. All the rules in the world will not relieve you of the necessity of being able to multiply a string of figures by any number from two to twelve.

Proof for Multiplication

Multiply the multiplier by the multiplicand; the result thus obtained should be the same as the first.

Proof by casting out 9's—Cast the 9's out of the multiplicand and the multiplier. Multiply the two excesses together and cast the 9's out of the result. If the last excess is equal to the excess of 9's in the product, the work is correct.

Illustration—

876	Excess of 9's in 876 is	3
483	Excess of 9's in 483 is	6
2628	6 × 3 = 18, excess of 9's in 18 is	0
7008		
3504		
423108	Excess of 9's in 423108 is	0

To the Teacher

The general plan for conducting a class exercise in multiplication will be much the same as the plan followed in addition exercises. First, the drills in concert, then the series of questions for individual work. A week may be taken for practice on a single figure, say 3. Following this, a week may be taken for practice on 13. The third week may be devoted to multiplication by 3⅓ and 33⅓, which will have the combined effect of illustrating a short method, and also practicing division by 3. The same general plan may be followed with all the digits. In conducting the concert drills the series outlined in the directions to students may be used. The fact will be noted that the speed indicated in each case will have to be slackened to give all members of the class a chance.

In setting a series for individual work all the points noted in connection with addition exercises will be observed here. Each student will work the whole series of questions, the time of leading member may be called out, each student may note his time on his paper and the name and time of the leading member may be placed on the board together with a list of correct results.

Practice in Handling Trade Discounts

If the class is far enough advanced a most valuable practice in handling trade discounts may be given with every exercise in multiplication. As each question in any series is extended and totalled, a discount or series of discounts may be deducted from the total. The same practice may be given in all addition questions, in which case the paper for the exercise would be prepared as for multiplication. Along this line we offer the following suggestions:

Trade Discount Questions

In each question of the series indicated, consider the result dollars and cents (thus the result 2330 would be considered $23.30) and take off the discounts indicated.

Series 154 to series 158	5, 5, 3⅓%
Series 160 to series 164	30, 5, 5, 3%
Series 161 to series 169	33⅓ and 5%
Series 25 to series 29	33⅓, 10, 10 and 5%
Series 31 to series 35	40, 5, 3%
Series 49 to series 53	30, 5, 2½ and ½%

For further questions see page 101.

4	2	5	3	7	8	2	9	4	7	8	2	6	5	7	9	8	4	3	8
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	1	2	2	1	2	1	2	2	1	2	2	2	1	2	2
2	2	3	3	2	3	2	3	3	2	3	3	2	3	2	3
3	3	4	4	3	2	4	4	3	4	2	4	3	4	4	2
4	4	5	5	3	5	5	3	2	5	4	5	4	5	3	5
5	5	4	6	4	5	3	6	6	5	1	6	6	4	2	6
6	6	3	7	7	4	5	7	3	7	5	7	4	7	5	7
7	7	8	4	5	2	8	5	8	4	8	5	8	3	8	5
8	8	1	3	9	5	7	4	9	9	7	9	9	4	3	9
9	9	3	6	8	9	4	1	4	7	5	6	9	7	5	3
10	2	5	6	4	8	6	7	8	1	3	9	6	3	5	8
11	1	9	8	4	5	3	8	7	9	4	5	9	7	3	4
12	7	3	6	5	4	5	7	8	4	9	5	4	6	7	2
13	5	8	9	4	5	7	6	3	9	6	5	8	5	4	9
14	4	6	4	7	7	9	8	9	6	5	4	1	8	7	3
15	6	7	8	8	4	2	3	5	6	9	8	7	5	6	8
16	3	9	5	8	3	7	5	9	6	2	4	9	7	4	5
17	9	3	5	4	3	8	9	4	7	3	5	4	7	5	2
18	7	4	1	3	7	8	5	4	9	8	3	5	6	7	8
19	4	4	4	6	6	7	7	8	8	9	9	4	5	3	7
20	2	4	7	4	4	3	8	9	7	5	6	9	9	7	5
21	8	9	6	9	8	7	5	4	3	2	7	5	7	4	9
22	5	6	7	8	9	4	6	9	8	6	4	9	6	9	7
23	6	4	7	5	2	9	7	8	5	7	8	3	9	7	9
24	7	6	9	9	8	6	5	9	4	6	7	5	7	4	7
25	3	7	5	8	9	4	7	5	9	6	8	4	3	5	7
26	9	5	9	8	4	6	9	8	4	5	3	9	8	7	6
27	7	5	7	8	9	7	5	9	3	7	9	5	7	8	9
28	3	2	7	7	8	5	9	7	8	4	1	6	3	6	4
29	5	7	9	8	6	5	4	8	3	9	7	9	8	4	9
30	7	5	4	7	3	9	5	7	9	8	3	7	5	9	7

WORK SERIES 139 TO SERIES 1[illegible]3. See page 68

4 2 5 3 7 8 2 9 4 7   2 6 5 7 9 8 4 3 8
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	1	2	2	1	2	1	2	2	1	2	2	2	1	2	2
2	2	3	3	2	3	2	3	3	2	3	3	2	3	2	3
3	3	4	4	3	2	4	4	3	4	2	4	3	4	4	2
4	4	5	5	3	5	5	3	2	5	4	5	4	5	3	5
5	5	4	6	4	5	3	6	6	5	1	6	6	4	5	3
6	6	3	7	7	4	5	7	3	7	5	7	4	7	5	7
7	7	8	4	5	2	8	5	8	4	8	5	8	3	8	5
8	8	1	3	9	5	7	4	9	7	9	9	4	3	3	9
9	9	3	6	8	9	4	1	4	7	5	6	9	7	5	3
10	2	5	6	4	8	6	7	8	1	3	9	6	3	5	8
11	1	9	8	4	5	3	8	7	9	4	5	9	7	3	4
12	7	3	6	5	4	5	7	8	4	9	5	4	6	7	2
13	5	8	9	4	5	7	6	3	9	6	5	8	5	4	9
14	4	6	7	7	9	8	9	7	6	5	4	1	8	7	3
15	6	7	8	9	4	2	3	5	6	9	8	7	5	6	8
16	3	9	5	8	3	7	5	9	6	2	4	9	7	4	5
17	9	3	5	4	3	8	9	4	7	3	5	4	7	5	2
18	7	4	1	3	7	8	5	4	9	8	3	5	6	7	8
19	4	4	4	6	6	7	7	8	8	9	9	4	5	3	7
20	2	4	7	4	4	3	8	9	7	5	6	9	9	7	5
21	8	9	6	9	8	7	5	4	3	2	7	5	7	4	9
22	5	6	7	8	9	4	6	9	8	6	4	9	6	9	7
23	6	4	7	5	2	9	7	8	5	7	8	3	9	7	9
24	7	6	9	9	8	6	5	9	4	6	7	5	7	4	7
25	3	7	5	8	9	4	7	5	9	6	8	4	3	5	7
26	9	5	9	8	4	6	9	8	4	5	3	9	8	7	6
27	7	5	7	8	9	7	5	9	3	7	9	5	7	8	9
28	3	6	7	7	8	5	9	7	8	4	1	6	3	6	4
29	5	7	9	8	6	5	4	8	3	9	7	9	8	4	9
30	7	5	4	7	3	9	5	7	9	8	3	7	5	9	7

WORK SERIES 144 TO SERIES 159. See pages 68 and 69

4 2 5 4 7 8 2 9 4 7 8 2 6 5 7 9 8 4 3 8
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	1	2	2	1	2	1	2	2	1	2	2	2	1	2	2
2	2	3	3	2	3	2	3	3	2	3	3	2	3	2	3
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4	4	5	5	3	5	5	3	2	5	4	5	4	5	3	5
5	5	4	6	4	5	3	6	6	5	1	6	6	4	2	6
6	6	3	7	7	4	5	7	3	7	5	7	4	7	5	7
7	7	8	4	5	2	8	5	8	4	8	5	8	3	8	2
8	8	1	3	9	5	7	4	9	9	7	9	9	4	3	9
9	9	3	6	8	9	4	1	4	7	5	6	9	7	5	3
10	2	5	6	4	8	6	7	8	1	3	9	6	3	5	8
11	1	9	8	4	5	3	8	7	9	4	5	9	7	3	4
12	7	3	6	5	4	5	7	8	4	9	5	4	6	7	2
13	5	8	9	4	5	7	6	3	9	6	5	8	5	4	9
14	4	6	4	7	7	9	8	9	6	5	4	1	8	7	3
15	6	7	8	9	4	2	3	5	6	9	8	7	5	6	8
16	3	9	5	8	3	7	5	9	6	2	4	9	7	4	5
17	9	3	5	4	3	8	9	4	7	3	6	4	7	5	2
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24	7	6	9	9	8	6	5	9	4	6	7	5	7	5	7
25	3	7	5	8	9	4	7	5	9	6	8	4	3	5	7
26	9	5	9	8	4	6	9	8	4	5	3	9	8	7	6
27	7	5	7	8	9	7	5	9	3	7	9	5	7	8	9
28	3	2	7	7	8	5	9	7	8	4	1	6	3	6	4
29	5	7	9	8	6	5	4	8	3	9	7	9	8	4	9
30	7	5	4	7	3	9	5	7	9	8	3	7	5	9	7

WORK SERIES 160 TO SERIES 174. See pages 69 and 70

4	2	5	4	7	8	2	9	4	7	8	2	6	7	9	8	4	3	8
5	5	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	1	2	2	1	2	1	2	2	1	2	2	2	1	2	2
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4	4	5	5	3	5	3	2	5	4	5	4	5	4	3	5
5	5	4	6	4	5	3	6	6	5	1	6	6	4	2	6
6	6	3	7	7	4	5	7	3	7	5	7	4	7	5	7
7	7	8	4	5	2	8	5	8	4	8	5	8	3	8	5
8	8	1	3	9	5	7	4	9	9	7	9	9	4	3	9
9	9	3	6	8	9	4	1	4	7	5	6	9	7	5	3
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17	9	3	5	4	3	9	4	7	3	5	4	7	5	2	2
18	7	4	1	3	7	8	5	4	9	8	3	5	6	7	8
19	4	4	4	6	6	7	7	8	8	9	9	4	5	3	7
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21	8	9	6	9	8	7	5	4	3	2	7	5	7	4	9
22	5	6	7	8	9	4	6	9	8	6	4	9	6	9	7
23	6	4	7	5	2	9	7	8	5	7	8	3	9	7	9
24	7	6	9	9	8	6	5	9	4	6	7	5	7	4	7
25	3	7	5	8	9	4	7	5	9	6	8	4	3	5	7
26	9	5	9	8	4	6	9	8	4	5	3	9	8	7	6
27	7	5	7	8	9	7	5	9	3	7	9	8	9	8	9
28	3	2	7	7	8	5	9	7	8	4	1	6	4	6	4
29	5	7	9	8	6	5	4	8	3	9	7	9	8	4	9
30	7	5	4	7	3	9	5	7	9	8	3	7	5	9	7

WORK SERIES 175 TO SERIES 189. See page 70

4	2	5	3	7	8	2	9	4	7	8	2	6	5	7	9	8	4	3	8
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	1	2	2	1	2	1	2	2	1	2	2	2	1	2	2
2	2	3	3	2	3	2	3	3	2	3	3	2	3	2	3
3	3	4	4	3	2	4	4	3	4	2	4	3	5	2	5
4	4	5	5	3	5	5	3	2	5	4	5	4	5	3	5
5	5	4	6	4	5	3	6	6	5	1	6	6	4	2	6
6	6	3	7	7	4	5	7	3	7	5	7	4	7	5	7
7	7	8	4	[illegible]	2	8	5	8	4	8	5	8	3	8	5
8	8	1	3	9	5	7	4	9	9	7	9	9	4	3	9
9	9	3	6	8	9	4	1	4	7	5	6	9	7	5	3
10	2	5	6	4	8	6	7	8	1	3	9	6	3	5	8
11	1	9	8	4	5	3	8	7	9	4	5	9	7	3	4
12	7	3	6	5	4	5	7	[illegible]	4	9	5	4	6	7	2
13	5	8	9	4	5	8	7	3	8	6	5	4	1	8	7
14	4	6	4	7	7	9	8	9	6	5	4	1	8	7	3
15	6	7	8	9	4	2	3	5	6	9	8	7	5	6	8
16	3	9	5	8	3	7	5	9	6	2	4	9	7	4	5
17	9	3	5	4	3	8	9	4	7	3	5	4	7	5	2
18	[illegible]	4	1	3	7	8	5	4	9	8	3	5	6	7	8
19	4	4	4	6	6	7	7	8	8	9	9	4	5	3	7
20	2	4	7	4	4	3	8	9	7	5	6	9	9	7	5
21	8	9	6	9	8	7	5	4	3	2	7	5	7	4	9
22	5	6	7	8	9	4	6	9	8	6	4	9	6	9	7
23	6	4	7	5	2	9	7	8	5	7	8	3	9	7	9
24	7	6	9	9	8	5	5	9	4	6	7	5	7	4	9
25	3	7	5	8	9	4	7	5	9	6	8	4	3	5	7
26	9	5	9	8	4	6	9	8	4	5	3	9	8	7	6
27	7	5	7	8	9	7	5	9	3	7	9	5	7	8	9
28	3	2	7	7	8	5	9	7	8	4	1	6	3	6	4
29	7	5	9	3	6	5	4	8	3	9	7	9	8	4	9
30	7	5	4	7	3	9	5	7	9	8	3	7	5	9	7

WORK SERIES 190 TO SERIES 205. See page 71

4	2	5	3	7	8	2	9	4	7	8	2	6	5	7	9	8	4	3	8
7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	1	2	2	1	2	1	2	1	1	2	2	1	2	2	2
2	2	3	3	2	3	3	2	3	3	2	3	3	2	3	3
3	3	4	4	3	2	4	4	3	4	2	4	3	4	4	2
4	4	5	5	3	5	5	3	2	5	4	5	4	5	3	5
5	5	4	6	4	5	3	6	6	5	1	6	6	4	2	6
6	6	3	7	7	4	5	7	3	7	5	7	4	7	5	7
7	7	8	4	5	2	8	5	8	4	8	5	8	3	8	5
8	8	1	3	9	5	7	4	7	9	7	9	9	4	3	9
9	9	3	6	8	9	4	1	4	7	5	6	9	7	5	3
10	2	5	6	4	8	6	7	8	1	3	9	6	3	5	8
11	1	9	8	4	5	3	8	7	9	4	5	9	7	3	4
12	7	3	6	5	4	5	8	7	4	9	5	4	6	7	2
13	5	8	9	4	5	7	6	3	9	6	5	8	5	4	9
14	4	6	4	7	7	9	8	9	6	5	4	1	8	7	3
15	6	7	8	9	4	2	3	5	6	9	8	7	5	6	8
16	3	9	5	8	3	7	5	9	6	2	4	9	7	4	5
17	9	3	5	4	3	8	9	4	7	3	5	4	7	5	2
18	7	4	1	3	7	8	5	4	8	3	5	6	6	7	8
19	4	4	4	6	6	7	7	8	8	9	9	4	5	3	7
20	2	4	7	4	4	3	8	9	7	5	6	9	9	7	5
21	8	9	6	9	8	7	6	4	3	2	7	5	7	4	9
22	5	6	7	8	9	4	6	9	8	6	4	9	6	9	7
23	6	4	7	5	2	9	8	7	5	7	8	3	9	7	9
24	7	6	9	9	8	6	5	9	4	6	7	5	7	4	7
25	3	7	5	8	9	4	7	5	9	6	8	4	3	5	7
26	9	5	9	8	4	6	9	8	4	5	3	9	8	7	6
27	7	5	7	8	7	9	5	9	3	7	9	5	8	7	9
28	3	2	7	7	8	5	7	8	4	9	6	3	6	4	4
29	5	7	9	8	6	3	4	8	3	9	7	9	8	4	9
30	7	5	4	7	3	9	5	7	9	8	3	7	5	9	7

WORK SERIES 206 TO SERIES 220. See pages 71 and 72

4 2 5 3 7 8 2 9 4 7 8 2 6 5 7 9 8 4 3 8
8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	1	2	2	1	2	1	2	2	1	2	2	2	1	2	2
2	2	3	3	2	3	2	3	3	2	3	3	2	3	2	3
3	3	4	4	3	2	4	4	3	4	2	4	3	4	4	2
4	4	5	5	3	5	5	3	2	5	4	5	4	5	3	5
5	5	4	6	4	5	3	6	6	5	1	6	6	4	2	6
6	6	3	7	7	4	5	7	3	7	5	7	4	7	5	[illegible]
7	7	8	4	5	2	8	5	8	4	8	5	8	3	8	5
8	8	1	3	9	5	7	4	9	9	7	9	9	4	3	9
9	9	3	6	8	9	4	1	4	7	5	6	9	7	5	3
10	2	5	6	4	8	6	7	8	1	3	9	6	3	5	8
11	1	9	8	4	5	3	8	7	9	4	5	9	7	3	4
12	7	3	6	5	4	5	7	8	4	9	5	4	6	7	2
13	5	8	9	4	5	7	6	3	9	6	5	8	5	4	9
14	4	6	4	7	7	9	8	9	6	5	[illegible]	1	8	7	3
15	6	7	8	9	4	2	3	5	6	9	8	7	5	6	8
16	3	9	5	8	3	7	5	9	6	2	4	9	7	4	5
17	9	3	5	4	3	8	9	4	7	3	5	4	7	5	2
18	7	4	1	3	7	8	5	4	9	8	3	5	6	7	[illegible]
19	4	4	4	6	6	7	7	8	8	4	[illegible]	4	5	3	7
20	2	4	7	4	4	3	8	9	7	5	6	9	9	7	5
21	8	9	6	9	8	7	5	4	[illegible]	2	[illegible]	5	7	4	[illegible]
22	[illegible]	6	7	8	9	[illegible]	6	9	8	[illegible]	[illegible]	9	6	9	7
23	6	4	7	5	[illegible]	[illegible]	7	8	5	[illegible]	3	3	9	7	9
24	7	6	9	9	8	6	5	9	4	[illegible]	[illegible]	5	7	4	7
25	3	7	5	8	[illegible]	4	[illegible]	5	9	[illegible]	8	4	3	5	7
26	9	5	[illegible]	8	[illegible]	6	[illegible]	[illegible]	4	[illegible]	3	9	8	7	6
27	7	5	7	8	9	7	[illegible]	[illegible]	[illegible]	7	9	5	7	8	9
28	3	2	7	7	8	[illegible]	[illegible]	[illegible]	8	4	1	6	3	6	4
29	5	7	9	8	6	5	[illegible]	[illegible]	3	9	7	9	8	4	9
30	7	5	4	7	3	9	[illegible]	[illegible]	9	8	3	7	5	9	7

W[illegible] Series 22[illegible] to Series 235. See page 72

4	2	5	3	7	8	3	4	7	8	8	6	5	7	9	8	4	3	8
9	9	9	9	9	9	9		9	9	9	9	9	9	9	9	9	9	9

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	1	2	2	1	2	1	2	2	1	[illegible]	2	2	1	2	2
2	2	3	3	2	3	2	3	3	2	3		2	3	2	3
3	[illegible]		4		2	4		3	4	2	4	3	4	4	2
4	4	5	5		5	5	3	2	5	4	5	4	5	3	5
5	5	4	6	4	5	3	6	6		1	6	6	[illegible]	2	6
6	6	3	7	7	4	5	7	3	[illegible]	5	7	4	[illegible]	5	7
7	7	8	4	5	2	8	5	8		8	5	8	3	8	5
8	8	1	3	9	5	7	4	9	[illegible]	7	9	9		3	9
9	9	3	6	8	9	[illegible]	1	4	7	5	6	9	7	5	3
10	2	5	6	[illegible]	[illegible]	6	[illegible]	8	1	3	9	6	3		8
11	1	9	8	4		[illegible]		7	9	4	5	9	7	3	
	7	3	6	5	4			8	4	9	5	4	6	7	2
13		8	9	4	5	[illegible]	[illegible]		9	6	5	8	5	4	9
14	4	6	4	7		9	8	9	6	5	4	1	8	7	3
15	6	7	[illegible]	[illegible]	[illegible]	[illegible]	3	5	6	9	8		5	6	8
16	3	9	5		3	7	5	9	6	2	4	[illegible]		4	5
17	9	3			3	8	9	4	7	3	5			5	2
18	7	4				8	5	4	9	8	3	5	6	7	8
19	4	4		[illegible]	[illegible]	7	7	8	8	9	9	[illegible]	5	3	
	2	4				3	8	9	7	5	6	9	9	7	
21	8	9			5	7	5	4	3	2	7	5	7	4	
[illegible]	5	6			9	4	6	9	8	6	4	9	6	9	
23	6	[illegible]	7	5	2	9	7	8	5	7	8	3	9	7	
24	7	6	9	9	8	6	5	9	4	6	7	5	7	4	7
25	3	7	5	8	9	4	7	5	9	6	8	1	3	5	7
26	9		[illegible]	8	4	6	9	8	4	5	3	8	9	7	6
27	7	[illegible]		8	9	7	5	9	3	7	9	5	7	8	9
28	3	2	7	7	8	5	9	7	8	4	1	[illegible]	3	6	4
29	5	7	9	8	6	5	4	8	3	9	7	9	8	4	6
30	7	5	4	7	[illegible]	9	3	7	9	8	3	7	5	9	7

WORK SERIES 236 TO SERIES 250. See page 73

$\frac{4}{11}$ $\frac{2}{11}$ $\frac{5}{11}$ $\frac{4}{11}$ $\frac{7}{11}$ $\frac{8}{11}$ $\frac{2}{11}$ $\frac{9}{11}$ $\frac{4}{11}$ $\frac{7}{11}$ $\frac{8}{11}$ $\frac{2}{11}$ $\frac{6}{11}$ $\frac{5}{11}$ $\frac{7}{11}$ $\frac{9}{11}$ $\frac{8}{11}$ $\frac{4}{11}$ $\frac{3}{11}$ $\frac{8}{11}$

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	1	2	2	1	2	1	2	2	1	2	2	2	1	2	2
2	2	3	3	2	3	2	3	3	2	3	3	2	3	2	3
3	3	4	4	3	2	4	4	3	4	2	4	3	4	4	2
4	4	5	5	3	5	5	3	2	5	4	5	4	5	3	5
5	5	4	6	4	5	3	6	6	5	1	6	6	4	2	6
6	6	3	7	7	4	5	7	3	7	5	7	4	7	5	7
7	7	8	4	5	2	8	5	8	4	8	5	8	3	8	5
8	8	1	3	9	5	7	4	9	9	7	9	9	4	3	9
9	9	3	6	8	9	4	1	4	7	5	6	9	7	5	3
10	2	5	6	4	8	6	7	8	1	3	9	6	3	5	8
11	1	9	8	4	5	3	8	7	9	4	5	9	7	3	4
12	7	3	6	5	4	5	7	8	4	9	5	4	6	7	2
13	5	8	9	4	5	7	6	3	9	6	5	8	5	4	9
14	4	6	4	7	7	9	8	9	6	5	4	1	8	7	3
15	6	7	8	9	4	2	3	5	6	9	8	7	5	6	8
16	3	9	5	8	3	7	5	9	6	2	4	9	7	4	5
17	9	3	5	4	3	8	9	4	7	3	5	4	7	5	2
18	7	4	1	3	7	8	5	4	9	8	3	5	6	7	8
19	4	4	4	6	6	7	7	8	8	9	9	4	5	3	7
20	2	4	7	4	4	3	8	9	7	5	6	9	9	7	5
21	8	9	6	9	8	7	5	4	3	2	7	5	7	4	9
22	5	6	7	8	9	4	6	9	8	6	4	9	6	9	7
23	6	4	7	5	2	9	7	8	5	7	8	3	9	7	9
24	7	6	9	9	8	6	5	9	4	6	7	5	7	4	7
25	3	7	5	8	9	4	7	5	9	6	8	4	3	5	7
26	9	5	9	8	4	6	9	8	4	5	3	9	8	7	6
27	7	5	7	8	9	7	5	9	3	7	9	5	7	8	9
28	3	2	7	7	8	5	9	7	8	4	1	6	3	6	4
29	5	7	9	8	6	5	4	8	3	9	7	9	8	4	9
30	7	5	4	7	3	9	5	7	9	8	3	7	5	9	7

Work Series 251 to Series 255. See page 73

$\frac{4}{12}$ $\frac{2}{12}$ $\frac{5}{12}$ $\frac{3}{12}$ $\frac{7}{12}$ $\frac{8}{12}$ $\frac{2}{12}$ $\frac{9}{12}$ $\frac{4}{12}$ $\frac{7}{12}$ $\frac{8}{12}$ $\frac{2}{12}$ $\frac{6}{12}$ $\frac{5}{12}$ $\frac{7}{12}$ $\frac{9}{12}$ $\frac{8}{12}$ $\frac{4}{12}$ $\frac{3}{12}$ $\frac{8}{12}$

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	1	2	2	1	2	1	2	2	1	2	2	2	1	2	2
2	2	3	3	2	3	2	3	3	2	3	3	2	3	2	3
3	3	4	4	3	2	4	3	4	2	4	4	3	4	4	2
4	4	5	5	3	5	5	3	2	5	4	5	4	5	3	5
5	5	4	6	4	5	3	6	6	5	1	6	6	4	2	6
6	6	3	7	7	4	5	7	3	7	5	7	4	7	5	7
7	7	8	4	5	2	8	5	8	4	8	5	8	3	8	5
8	8	1	3	9	5	7	4	9	9	7	9	9	4	3	9
9	9	3	6	8	9	4	1	4	7	5	6	9	7	5	3
10	2	5	6	4	8	6	7	8	1	3	9	6	3	5	8
11	1	9	8	4	5	3	8	7	9	4	5	9	7	3	4
12	7	3	6	5	4	5	7	8	4	9	5	4	6	7	2
13	5	8	9	4	5	7	6	3	9	6	5	8	5	4	9
14	4	6	4	7	7	9	8	9	6	5	4	1	8	7	3
15	6	7	8	9	4	2	3	5	6	9	8	7	5	6	8
16	3	9	5	8	3	7	5	9	6	2	4	9	7	4	5
17	9	3	5	4	3	8	9	4	7	3	5	4	7	5	2
18	7	4	1	3	7	8	5	4	9	8	3	5	6	7	8
19	4	4	4	6	6	7	7	8	8	9	9	4	5	3	7
20	2	4	7	4	4	3	8	9	7	5	6	9	9	7	5
21	8	9	6	9	8	7	5	4	3	2	7	5	7	4	9
22	5	6	7	8	9	4	6	9	8	6	4	9	6	9	7
23	6	4	7	5	2	9	7	8	5	7	8	3	9	7	9
24	7	6	9	9	8	6	5	9	4	6	7	5	7	4	7
25	3	7	5	8	9	4	7	5	9	6	8	4	3	5	7
26	9	5	9	8	4	6	9	8	4	5	3	9	8	7	6
27	7	5	7	8	9	7	5	9	3	7	9	5	7	8	9
28	3	2	7	7	8	5	9	7	8	4	1	6	3	6	4
29	5	7	9	8	6	5	4	8	3	9	7	9	8	4	9
30	7	5	4	7	3	9	5	7	9	8	3	7	5	9	7

Work Series 256 to Series 260. See page 73

Addition Drills

Series 1

1. 8 D Lt
2. 9 A E
3. 10 K Rt
4. 11 J N
5. 9 I M
6. 10 H L
7. 11 G K
8. 12 F J
9. 11 E I
10. 13 C H

Series 2

1. 2 12 F J
2. 3 13 G K
3. 2 14 H M
4. 3 15 I N
5. 4 16 K Rt
6. 3 18 J N
7. 5 17 E I
8. 6 19 D H
9. 4 18 C G
10. 3 17 A F

Series 3

1. 5 16 D Lt
2. 4 18 A E
3. 6 20 B F
4. 5 19 C H
5. 6 20 K Rt
6. 7 19 J N
7. 8 21 I M
8. 6 23 H K
9. 5 21 F J
10. 6 22 D H

Series 4

1. 7 18 F J
2. 6 19 E I
3. 8 20 DH
4. 9 23 C G
5. 10 20 B F
6. 9 22 A E
7. 7 24 D Lt
8. 11 21 G K
9. 12 24 H L
10. 13 26 J N

Series 5

1. 14 28 K Rt
2. 13 27 D Lt
3. 14 29 B F
4. 15 30 J N
5. 12 27 C G
6. 13 29 D H
7. 8 28 E I
8. 7 27 G J
9. 9 29 I L
10. 10 30 A F

Series 6

1. 30 B Lt
2. 30 B D
3. 30 C E
4. 30 E G
5. 30 G I
6. 30 I K
7. 30 J L
8. 30 K N
9. 30 M Rt
10. Entire Page

Series 7

1. 10 D Lt
2. 12 A E
3. 11 K Rt
4. 12 J N
5. 13 B F
6. 10 C G
7. 14 D H
8. 13 E I
9. 12 F J
10. 13 G K

Series 8

1. 2 14 K Rt
2. 3 15 J N
3. 4 18 I M
4. 3 17 H L
5. 2 16 D Lt
6. 3 17 A E
7. 4 18 B F
8. 3 17 C G
9. 5 20 D H
10. 3 15 E I

Series 9

1. 5 16 K Rt
2. 6 18 J N
3. 4 15 I M
4. 7 22 H L
5. 6 23 G K
6. 5 22 D Lt
7. 8 24 A E
8. 9 26 B F
9. 8 23 C G
10. 9 27 E J

Series 10

1. 7 27 D Lt
2. 6 25 A F
3. 8 28 B G
4. 9 24 D I
5. 10 25 F J
6. 6 24 K Rt
7. 7 25 J N
8. 8 26 I M
9. 7 [illegible] H L
10. 9 29 G K

Series 11

1. 12 24 F K
2. 13 26 E I
3. 11 27 D H
4. 10 26 B G
5. 9 28 A E
6. 13 24 G L
7. 14 28 H M
8. 15 27 I N
9. 17 29 I Rt
10. 3 30 G K

Series 12

1. 30 B Lt
2. 30 B D
3. 30 C E
4. 30 E G
5. 30 G I
6. 30 I K
7. 30 J L
8. 30 K M
9. 30 M Rt
10. Entire Page

Series 13

1. 10 D Lt
2. 12 K Rt
3. 13 J N
4. 10 H L
5. 15 L Rt
6. 14 C H
7. 12 C G
8. 10 B H
9. 11 E J
10. 14 B G

Series 14

1. 3 12 B H
2. 2 10 C I
3. 4 16 E Lt
4. 3 13 J Rt
5. 4 15 H L
6. 5 15 D I
7. 6 16 A F
8. 5 17 B H
9. 4 20 E J
10. 16 K Rt

Series 15

1. 6 18 E Lt
2. 5 17 A E
3. 8 16 C J
4. 9 25 C G
5. 3 20 E H
6. 8 30 C Lt
7. 9 23 K Rt
8. 7 17 G M
9. 8 16 E J
10. 15 K Rt

Series 16

1. 11 21 D Lt
2. 9 19 K Rt
3. 8 21 A F
4. 7 22 C G
5. 10 25 B H
6. 12 26 E I
7. 13 28 L Rt
8. 12 26 G K
9. 14 30 B F
10. 12 30 D Lt

Series 17

1. 3 30 C Lt
2. 13 30 A G
3. 20 29 J Rt
4. 17 30 D K
5. 5 28 D H
6. 4 30 L Rt
7. 6 30 B F
8. 10 28 A F
9. 5 30 H L
10. 6 26 I M

Series 18

1. 30 B Lt
2. 30 B D
3. 30 C E
4. 30 E G
5. 30 G I
6. 30 I K
7. 30 J L
8. 30 K M
9. 30 M Rt
10. Entire Page

Series 19

1. 8 C Lt
2. 6 B G
3. 9 K Rt
4. 8 I M
5. 10 C H
6. 12 E J
7. 11 J N
8. 12 F I
9. 8 C H
10. 12 D G

Series 20

1. 2 12 D Lt
2. 2 12 K Rt
3. 2 12 F K
4. 3 11 B F
5. 3 11 D H
6. 4 12 L Rt
7. 2 14 C G
8. 4 14 A E
9. 5 15 D Lt
10. 6 14 D I

Series 21

1. 10 18 D Lt
2. 10 18 K Rt
3. 9 18 B F
4. 12 20 A E
5. 12 20 J Rt
6. 9 19 H L
7. 5 20 D H
8. 6 20 H M
9. 7 17 D I
10. 4 20 D G

Series 22

1. 12 20 D Lt
2. 13 23 L Rt
3. 11 21 G K
4. 14 24 B F
5. 15 30 C Lt
6. 8 30 C F
7. 12 28 A E
8. 13 27 D H
9. 15 27 K Rt
10. 16 30 H L

Series 23

1. 30 C Lt
2. 8 30 A D
3. 10 30 D G
4. 3 30 G J
5. 19 30 F Lt
6. 15 30 H Rt
7. 12 30 B E
8. 4 30 C E
9. 5 30 F H
10. 3 28 I L

Series 24

1. 30 C Lt
2. 30 L Rt
3. 30 C F
4. 30 I L
5. 30 F I
6. 30 A D
7. 30 B E
8. 30 E H
9. 30 G J
10. Entire Page

Series 25

1. 10 E Lt
2. 12 B G
3. 13 D H
4. 12 K Rt
5. 15 H M
6. 13 C H
7. 16 D Lt
8. 16 L Rt
9. 14 B F
10. 15 G K

Series 26

1. 2 17 D Lt
2. 2 18 B F
3. 3 19 D H
4. 4 20 F K
5. 2 22 I M
6. 4 24 K Rt
7. 5 25 H M
8. 6 24 E Lt
9. 4 24 A E
10. 7 27 B F

Series 27

1. 8 20 E Lt
2. 7 22 A F
3. 8 23 C H
4. 9 26 E I
5. 10 25 F K
6. 12 28 I M
7. 13 27 K Rt
8. 15 30 I N
9. 6 26 D I
10. 7 27 A E

Series 28

1. 12 30 D Lt
2. 14 30 B G
3. 10 30 D H
4. 9 29 F J
5. 5 30 D G
6. 11 30 F K
7. 13 30 K Rt
8. 15 30 F J
9. 8 30 L Rt
10. 5 28 H K

Series 29

1. 30 C Lt
2. 30 B E
3. 30 F I
4. 30 J M
5. 3 30 D Lt
6. 5 30 B F
7. 2 28 E I
8. 2 30 K Rt
9. 4 30 I L
10. 10 30 H Rt

Series 30

1. 30 C Lt
2. 30 F I
3. 30 I L
4. 30 L Rt
5. 30 C F
6. 30 A D
7. 30 E H
8. 30 B E
9. 30 H J
10. Entire Page

Addition Drills

	Series 31	Series 32	Series 33	Series 34	Series 35
1.	10 D Lt	2 12 D Lt	7 17 C Lt	11 21 C Lt	15 30 A E
2.	12 C G	3 13 B F	6 15 A E	12 22 C G	5 30 C Lt
3.	13 G L	4 15 D H	8 18 C G	10 24 B F	6 26 C G
4.	11 E J	2 15 F J	9 20 F J	13 26 D H	10 30 F J
5.	14 K Rt	3 16 H M	6 20 G K	15 30 K Rt	4 28 H K
6.	15 I M	4 17 J N	8 24 I M	14 24 E J	3 30 K N
7.	12 A E	6 15 K Rt	10 20 J Rt	12 28 I L	2 30 B E
8.	14 B F	2 16 A D	9 19 H L	15 30 D Lt	8 28 D H
9.	10 D I	3 17 C G	7 21 J M	17 27 A D	30 C F
10.	15 F J	4 14 F K	8 18 G K	16 30 C G	30 G I

	Series 36	Series 37	Series 38	Series 39	Series 40
1.	30 B Lt	10 D Lt	3 13 A E	6 20 L Rt	13 26 L Rt
2.	30 B D	12 A E	4 13 B F	5 15 I N	14 24 J N
3.	30 D F	10 K Rt	3 16 K Rt	7 22 G K	10 28 G K
4.	30 M Rt	12 G K	5 15 C G	6 26 F I	11 26 D H
5.	30 K M	8 B F	4 15 F K	10 20 C G	9 23 C F
6.	30 I K	9 D H	2 16 I M	13 23 D Lt	8 28 A E
7.	30 H J	13 G J	5 20 K Rt	14 28 A D	7 24 D Lt
8.	30 F H	15 I M	3 23 G J	16 26 E H	6 25 D H
9.	30 J L	14 F I	4 18 C F	2 22 G K	9 29 F J
10.	Entire Page	11 J N	2 20 D H	8 24 I L	2 28 C Lt

	Series 41	Series 42	Series 43	Series 44	Series 45
1.	7 30 L Rt	30 B Lt	10 D Lt	2 14 L Rt	6 16 K Rt
2.	9 29 I M	30 B D	8 B F	3 13 J M	7 17 C Lt
3.	4 28 G J	30 D F	10 K Rt	4 18 I L	8 16 A F
4.	3 28 C F	30 M Rt	12 J N	2 16 G K	6 16 C G
5.	8 30 A D	30 K M	11 I L	4 16 E H	7 18 D H
6.	30 B Lt	30 I K	13 G J	5 20 D G	8 20 F I
7.	30 L Rt	30 H J	10 F K	3 16 B F	9 21 G K
8.	10 30 B E	30 F H	12 D H	2 16 C Lt	10 22 I L
9.	12 29 C G	30 J L	10 B E	5 15 B E	9 23 J M
10.	2 30 F I	Entire Page	13 D G	4 18 A D	8 24 K N

	Series 46	Series 47	Series 48	Series 49	Series 50
1.	10 20 A E	18 30 A E	30 B Lt	12 D Lt	2 14 K Rt
2.	11 21 C Lt	17 27 B F	30 B D	14 A E	3 16 J N
3.	12 22 D H	20 30 K Rt	30 D F	15 B F	4 18 H L
4.	13 24 C F	15 30 J M	30 M Rt	13 D H	3 18 F J
5.	14 26 E I	14 29 G J	30 K M	15 F J	2 19 E I
6.	15 25 G K	5 25 B Lt	30 I K	14 G K	4 20 C G
7.	11 26 J M	6 26 J L	30 H J	13 L Rt	5 25 B F
8.	13 27 L Rt	8 30 B E	30 F H	15 J N	4 24 A E
9.	9 24 A D	30 E G	30 J L	16 I M	4 26 C Lt
10.	10 25 B E	30 I K	Entire Page	15 H L	6 26 B G

	Series 51	Series 52	Series 53	Series 54	Series 55
1.	7 22 D Lt	8 25 L Rt	4 28 C Lt	30 B Lt	12 F Lt
2.	6 23 A E	10 27 J M	2 28 A D	30 B D	14 B G
3.	8 24 K Rt	13 23 G L	5 30 C F	30 D F	15 D J
4.	9 26 J N	15 30 I M	6 29 D G	30 M Rt	16 E K
5.	7 26 H L	12 27 E I	8 30 E I	30 K M	13 F L
6.	10 24 F K	13 28 D H	9 29 F K	30 I K	16 H M
7.	8 26 E I	14 29 C G	18 30 J Rt	30 H J	14 J Rt
8.	11 21 F L	11 27 B F	14 29 E Lt	30 F H	15 I N
9.	12 26 C G	14 30 D G	30 D G	30 J L	12 G L
10.	6 26 D Lt	10 30 A D	30 H K	Entire Page	15 F J

	Series 56	Series 57	Series 58	Series 59	Series 60
1.	3 15 D Lt	7 22 K Rt	10 20 D Lt	14 28 D Lt	30 B Lt
2.	2 16 A E	6 23 J N	11 26 B F	15 30 B F	30 B D
3.	4 18 C G	5 25 I M	10 24 A E	16 29 C G	30 D F
4.	3 18 D I	8 24 H L	13 25 C G	18 30 D I	30 M Rt
5.	5 20 E J	9 23 F J	14 26 D I	19 30 E J	30 K M
6.	4 20 F K	10 25 D I	13 27 E J	20 30 E Lt	30 I K
7.	6 22 G L	8 24 C H	10 26 G K	4 28 I L	30 H J
8.	7 21 I M	11 21 F Lt	15 27 I M	5 30 L Rt	30 F H
9.	3 23 J N	9 29 B F	14 28 J N	6 29 H K	30 J L
10.	2 22 K Rt	6 23 A E	12 27 K Rt	3 30 E H	Entire Page

Addition Drills

Series 61

1. 10 E Lt
2. 12 A F
3. 14 C H
4. 13 E J
5. 15 G K
6. 12 H L
7. 14 I M
8. 12 J N
9. 15 K Rt
10. 10 F K

Series 62

1. 2 12 K Rt
2. 3 14 J N
3. 4 16 H L
4. 3 18 G K
5. 4 18 E J
6. 2 17 D H
7. 3 18 C G
8. 2 20 B F
9. 4 24 A E
10. 3 18 C Lt

Series 63

1. 5 17 A D
2. 4 16 B F
3. 6 20 C G
4. 5 21 D H
5. 4 22 K Rt
6. 5 18 J N
7. 7 17 H M
8. 8 20 G L
9. 6 18 F K
10. 9 21 E I

Series 64

1. 10 20 K Rt
2. 11 22 D Lt
3. 9 23 A E
4. 10 25 J N
5. 12 28 C G
6. 11 26 I M
7. 12 24 D I
8. 13 27 G L
9. 15 28 F J
10 3 23 E H

Series 65

1. 5 25 K N
2. 7 27 I L
3. 6 24 G K
4. 3 28 E H
5. 10 30 C G
6. 15 30 D Lt
7. 8 28 A D
8. 4 30 C F
9. 30 G I
10. 30 J M

Series 66

1. 30 B Lt
2. 30 B D
3. 30 D F
4. 30 M Rt
5. 30 K M
6. 30 I K
7. 30 H J
8. 30 F H
9. 30 J L
10. Entire Page

Series 67

1. 10 E Lt
2. 12 A F
3. 10 F K
4. 15 K Rt
5. 14 C H
6. 13 E J
7. 15 G K
8. 12 H L
9. 14 I M
10. 13 J N

Series 68

1. 2 13 K Rt
2. 3 15 J N
3. 4 16 H L
4. 3 17 G K
5. 4 19 E J
6. 2 18 D H
7. 3 19 C G
8. 2 20 B F
9. 3 23 A E
10. 4 19 C Lt

Series 69

1. 9 21 E I
2. 6 19 F K
3. 8 20 G L
4. 7 18 H M
5. 4 19 J N
6. 5 22 K Rt
7. 4 21 D H
8. 6 20 C G
9. 3 16 B F
10. 4 20 A D

Series 70

1. 10 20 K Rt
2. 11 22 D Lt
3. 15 28 F J
4. 14 27 G L
5. 10 24 D I
6. 11 26 I M
7. 12 28 C G
8. 9 25 J M
9. 13 23 A E
10. 10 26 G K

Series 71

1. 5 25 K N
2. 7 28 I L
3. 6 24 G K
4. 3 25 E H
5. 10 30 C G
6. 15 30 D Lt
7. 8 28 A D
8. 4 30 C F
9. 30 G I
10. 30 J M

Series 72

1. 30 B Lt
2. 30 B D
3. 30 D F
4. 30 M Rt
5. 30 K M
6. 30 I K
7. 30 H J
8. 30 F H
9. 30 J L
10. Entire Page

Series 73

1. 10 E Lt
2. 12 A F
3. 14 C H
4. 13 E J
5. 15 G K
6. 12 H L
7. 14 I M
8. 15 J N
9. 14 K Rt
10. 12 F K

Series 74

1. 2 12 K Rt
2. 3 14 J N
3. 4 16 H L
4. 3 18 G K
5. 4 18 E J
6. 2 17 D H
7. 3 18 C G
8. 2 20 B F
9. 4 25 A E
10. 3 18 C Lt

Series 75

1. 5 18 A D
2. 4 16 B F
3. 6 20 C G
4. 5 21 D H
5. 4 23 K Rt
6. 5 18 J N
7. 7 17 H M
8. 8 20 G L
9. 6 18 F K
10. 9 21 E I

Series 76

1. 10 20 K Rt
2. 11 23 D Lt
3. 9 24 A E
4. 10 25 J N
5. 12 28 C G
6. 11 26 I M
7. 12 24 D I
8. 13 27 G L
9. 15 30 F J
10. 3 23 E H

Series 77

1. 5 25 K N
2. 7 26 I L
3. 6 24 G K
4. 3 26 E H
5. 10 30 C G
6. 15 30 C Lt
7. 8 28 A D
8. 4 30 C F
9. 30 B E
10. 2 30 F I

Series 78

1. 30 B Lt
2. 30 B D
3. 30 D F
4. 30 M Rt
5. 30 K M
6. 30 I K
7. 30 H J
8. 30 F H
9. 30 J L
10. Entire Page

Series 79

1. 10 A E
2. 13 D Lt
3. 12 K Rt
4. 13 F J
5. 11 B F
6. 15 D H
7. 16 E I
8. 14 G K
9. 15 I M
10. 16 I L

Series 80

1. 2 16 K Rt
2. 3 18 J N
3. 4 20 H L
4. 3 19 G K
5. 2 20 F J
6. 3 23 D Lt
7. 4 25 B E
8. 3 24 C G
9. 6 26 D H
10. 4 25 E I

Series 81

1. 9 26 L Rt
2. 10 27 J N
3. 8 24 D Lt
4. 6 27 B F
5. 8 28 I M
6. 7 24 H K
7. 6 27 F J
8. 11 26 B L
9. 13 23 E Lt
10. 15 27 D I

Series 82

1. 5 23 B F
2. 2 22 D Lt
3. 4 25 B E
4. 6 26 D H
5. 4 16 E Lt
6. 5 20 D I
7. 6 24 G L
8. 8 24 I M
9. 10 20 J Rt
10. 7 21 F K

Series 83

1. 11 21 D Lt
2. 13 27 B F
3. 14 28 K Rt
4. 16 30 I N
5. 12 27 G K
6. 9 29 F J
7. 6 27 D G
8. 10 30 B F
9. 2 28 A C
10. 3 30 I K

Series 84

1. 30 B Lt
2. 30 B D
3. 30 D F
4. 30 M Rt
5. 30 K M
6. 30 I K
7. 30 H J
8. 30 F H
9. 30 J L
10. Entire Page

Series 85

1. 11 E Lt
2. 12 A F
3. 10 F K
4. 15 K Rt
5. 14 B H
6. 13 E J
7. 14 G K
8. 12 H L
9. 15 I M
10. 13 J N

Series 86

1. 2 14 K Rt
2. 3 15 J N
3. 4 15 H L
4. 3 17 G K
5. 4 20 E J
6. 2 18 D H
7. 3 19 C G
8. 2 21 B F
9. 4 24 A E
10. 3 19 C Lt

Series 87

1. 8 21 E I
2. 4 19 F K
3. 8 21 G L
4. 7 20 H M
5. 4 19 J N
6. 6 22 K Rt
7. 3 21 D H
8. 6 20 C G
9. 3 16 B F
10. 4 25 A D

Series 88

1. 10 21 K Rt
2. 11 22 D Lt
3. 15 28 F J
4. 14 27 G L
5. 10 25 D I
6. 11 26 I M
7. 12 27 C G
8. 9 24 J N
9. 13 23 A E
10. 11 26 G K

Series 89

1. 4 25 K N
2. 6 28 I L
3. 7 24 G K
4. 3 25 E H
5. 10 30 C G
6. 16 30 D Lt
7. 8 27 A D
8. 5 30 C F
9. 2 22 L Rt
10. 4 28 F I

Series 90

1. 30 B Lt
2. 30 B D
3. 30 D F
4. 30 M Rt
5. 30 K M
6. 30 I K
7. 30 H J
8. 30 F H
9. 30 J L
10. Entire Page

Addition Drills

Series 91
1. 10 E Lt
2. 13 A F
3. 10 F K
4. 14 K Rt
5. 13 C H
6. 12 E J
7. 14 G K
8. 11 H L
9. 15 I M
10. 14 J N

Series 92
1. 2 14 K Rt
2. 3 16 J N
3. 4 16 H L
4. 3 18 G K
5. 4 19 E J
6. 2 17 D H
7. 3 18 C G
8. 2 19 B F
9. 3 20 A E
10. 4 24 C Lt

Series 93
1. 8 22 E I
2. 7 19 F K
3. 7 21 G L
4. 8 18 H M
5. 4 20 J N
6. 5 21 K Rt
7. 4 22 D H
8. 6 21 C G
9. 3 18 B F
10. 5 21 A D

Series 94
1. 10 21 K Rt
2. 11 22 D Lt
3. 15 27 F J
4. 14 28 G L
5. 9 23 D I
6. 11 27 I M
7. 12 26 C G
8. 8 25 J N
9. 13 24 A E
10. 10 25 G K

Series 95
1. 4 24 K N
2. 7 26 I L
3. 6 27 G K
4. 3 24 E H
5. 10 28 C G
6. 14 28 D Lt
7. 7 29 A D
8. 5 30 C F
9. 3 29 G I
10. 2 30 J M

Series 96
1. 30 B Lt
2. 30 B D
3. 30 D F
4. 30 M Rt
5. 30 K M
6. 30 I K
7. 30 H J
8. 30 F H
9. 30 J L
10. Entire Page

Series 97
1. 10 E Lt
2. 12 A F
3. 10 F K
4. 14 K Rt
5. 13 B H
6. 12 E J
7. 14 G K
8. 12 H L
9. 13 I M
10. 14 J N

Series 98
1. 2 14 K Rt
2. 3 15 J N
3. 4 15 H L
4. 3 16 G K
5. 4 19 E J
6. 2 18 D H
7. 3 17 C G
8. 2 18 B F
9. 4 20 A E
10. 3 19 C Lt

Series 99
1. 7 21 E I
2. 4 19 F K
3. 8 21 G L
4. 6 20 H M
5. 4 19 J M
6. 6 21 K Rt
7. 3 20 D H
8. 6 20 C G
9. 3 16 B F
10. 4 24 A D

Series 100
1. 10 20 K Rt
2. 11 22 D Lt
3. 14 28 F J
4. 14 27 G L
5. 10 25 D I
6. 11 26 I M
7. 13 27 C G
8. 9 23 J N
9. 13 23 A E
10. 11 26 G K

Series 101
1. 4 25 K N
2. 6 28 I L
3. 7 23 G K
4. 3 24 E H
5. 10 30 C G
6 16 30 D Lt
7 8 27 A D
8. 5 29 C F
9 2 22 L Rt
10. 4 27 F I

Series 102
1. 30 B Lt
2. 30 B D
3. 30 D H
4. 30 M Rt
5. 30 K M
6. 30 I K
7. 30 H J
8. 30 F H
9. 30 J L
10. Entire Page

Series 103
1. 10 E Lt
2. 11 A F
3. 12 C H
4. 13 E J
5. 14 G K
6. 10 H L
7. 12 I M
8. 13 J N
9. 10 K Rt
10. 10 F K

Series 104
1. 2 12 K Rt
2. 3 14 J N
3. 4 15 H L
4. 3 16 G K
5. 4 [illegible] E J
6. 2 17 D H
7. 3 16 C G
8. 2 17 B F
9. 4 18 A E
10. 3 16 D Lt

Series 105
1. 5 18 A D
2. 4 16 B F
3. 6 18 C G
4. 5 20 D H
5. 4 20 K Rt
6. 5 18 J N
7. 7 17 H M
8. 9 21 G L
9. 6 18 F K
10. 9 22 E I

Series 106
1. 10 20 K Rt
2. 11 23 D Lt
3. 9 23 A E
4. 10 25 J N
5. 12 28 C G
6. 11 25 I M
7. 12 24 D I
8. 13 26 G L
9. 15 28 F J
10. 3 23 H E

Series 107
1. 5 25 K N
2. 7 26 I L
3. 6 23 G K
4. 3 26 E H
5 10 29 C G
6. 15 30 C Lt
7. 8 28 A D
8. 4 26 C F
9. 2 30 B E
10. 5 28 F I

Series 108
1. 30 B Lt
2. 30 B D
3. 30 D H
4. 30 M Rt
5. 30 K M
6. 30 I K
7. 30 H J
8. 30 F H
9. 30 J L
10. Entire Page

Series 109
1. 11 D Lt
2. 10 A F
3. 13 C H
4. 12 E J
5. 13 G K
6. 14 H L
7. 13 I M
8. 14 J N
9. 12 K Rt
10. 14 F K

Series 110
1. 2 12 K Rt
2. 3 15 J N
3. 4 16 H L
4. 4 18 G K
5. 3 17 E J
6. 2 16 G H
7. 3 18 C G
8. 2 19 B F
9. 4 18 A E
10. 3 17 C Lt

Series 111
1. 6 18 A D
2. 5 17 B F
3. 6 20 C G
4. 5 21 D H
5. 4 20 K Rt
6. 6 18 J N
7. 6 18 H M
8. 7 20 G L
9. 6 19 F K
10. 8 20 E I

Series 112
1. 9 20 K Rt
2. 11 22 D Lt
3. 10 23 A E
4. 11 25 J N
5. 12 28 C G
6. 12 26 I M
7. 13 25 D I
8. 13 27 G L
9. 15 30 F J
10. 4 23 E H

Series 113
1. 11 27 K N
2. 8 26 I L
3. 6 24 G K
4. 3 24 E H
5. 10 30 C G
6. 14 30 C Lt
7. 8 27 A D
8. 4 28 C F
9. 3 26 B E
10. 2 30 F I

Series 114
1. 30 B Lt
2. 30 B D
3. 30 D H
4. 30 M Rt
5. 30 K M
6. 30 I K
7. 30 H J
8. 30 F H
9. 30 J L
10. Entire Page

Series 115
1. 10 D Lt
2. 12 A E
3. 11 F K
4. 12 K Rt
5. 11 C H
6. 12 E J
7. 10 G K
8. 12 H L
9. 11 I M
10. 13 J N

Series 116
1. 2 13 K Rt
2. 3 14 J N
3. 4 16 H L
4. 3 15 G K
5. 4 18 E J
6. 2 17 D H
7. 3 16 C G
8. 2 17 B F
9. 4 18 A E
10. 3 17 G Lt

Series 117
1. 6 20 E I
2. 4 18 F K
3. 8 20 G L
4. 6 20 H M
5. 4 18 J M
6. 5 20 K Rt
7. 3 17 D H
8. 5 19 C G
9. 3 16 B F
10. 4 23 F D

Series 118
1 10 21 K Rt
2. 11 23 D Lt
3. 13 27 F J
4. 14 28 G L
5. 10 24 D I
6. 11 25 I M
7. 13 26 C G
8 10 23 J N
9. 14 24 A E
10. 11 26 G K

Series 119
1. 4 24 K N
2. 6 26 I L
3. 7 23 G K
4. 3 24 E H
5. 10 30 C G
6. 15 30 D Lt
7. 8 28 A D
8. 5 29 C F
9. 2 22 L Rt
10. 4 28 F I

Series 120
1. 30 B Lt
2. 30 B D
3. 30 D H
4. 30 M Rt
5. 30 K M
6. 30 I K
7. 30 H J
8. 30 F H
9. 30 J L
10. Entire Page

Addition Drills

Series 121
1. 10 E Lt
2. 11 A F
3. 12 C H
4. 12 E J
5. 13 G K
6. 10 H L
7. 11 I M
8. 12 J N
9. 10 K Rt
10. 10 F K

Series 122
1. 2 12 K Rt
2. 3 15 J N
3. 4 15 H L
4. 3 16 G K
5. 4 15 E J
6. 2 17 D H
7. 3 16 C G
8. 2 16 B F
9. 4 18 A E
10. 3 15 D Lt

Series 123
1. 5 17 A D
2. 4 15 B F
3. 6 18 C G
4. 5 19 D H
5. 4 18 K Rt
6. 5 19 J N
7. 7 17 H M
8. 9 21 G L
9. 6 19 F K
10. 9 21 E I

Series 124
1. 10 20 K Rt
2. 11 22 D Lt
3. 9 21 A E
4. 10 24 J N
5. 12 26 C G
6. 11 24 I M
7. 12 24 D L
8. 13 25 G L
9. 15 28 F J
10. 3 23 E H

Series 125
1. 5 24 K N
2. 7 23 I L
3. 6 24 G K
4. 3 26 E H
5. 10 28 C G
6. 15 30 C Lt
7. 8 27 A D
8. 4 25 C F
9. 2 28 B E
10. 5 25 F I

Series 126
1. 30 B Lt
2. 30 B D
3. 30 D H
4. 30 M Rt
5. 30 K M
6. 30 I K
7. 30 H J
8. 30 F H
9. 30 J L
10. Entire Page

Series 127
1. 10 E Lt
2. 11 A F
3. 10 F K
4. 14 K Rt
5. 11 C H
6. 12 E J
7. 10 G K
8. 11 H L
9. 12 I M
10. 13 J N

Series 128
1. 2 12 K Rt
2. 3 13 J N
3. 4 15 H L
4. 3 16 G K
5. 4 18 E J
6. 2 16 D H
7. 3 17 C G
8. 2 18 B F
9. 4 19 A E
10. 3 18 C Lt

Series 129
1. 8 20 E I
2. 4 16 F K
3. 8 19 G L
4. 7 20 H M
5. 4 19 J N
6. 6 23 K Rt
7. 3 20 D H
8. 6 21 C G
9. 3 16 B F
10. 4 24 A D

Series 130
1. 10 20 K Rt
2. 11 22 D Lt
3. 14 28 F J
4. 13 27 G L
5. 10 24 D I
6. 11 25 I M
7. 12 26 C G
8. 9 3 J N
9. 13 23 A E
10. 10 25 G K

Series 131
1. 4 22 K N
2. 6 26 I L
3. 7 23 G K
4. 3 24 E H
5. 10 30 C G
6. 16 26 D Lt
7. 8 27 A D
8. 5 25 C F
9. 2 22 L Rt
10. 4 26 F I

Series 132
1. 30 B Lt
2. 30 B D
3. 30 D H
4. 30 M Rt
5. 30 K M
6. 30 I K
7. 30 M J
8. 30 F H
9. 30 J L
10. Entire Page

Series 133
1. 10 D Lt
2. 10 A F
3. 13 C H
4. 12 E J
5. 11 G K
6. 12 H L
7. 11 I M
8. 12 J N
9. 12 K Rt
10. 13 F K

Series 134
1. 2 12 K Rt
2. 3 14 J N
3. 4 15 H L
4. 4 16 G K
5. 3 17 E J
6. 2 16 D H
7. 3 17 C G
8. 2 18 B F
9. 4 18 A E
10. 3 16 C Lt

Series 135
1. 6 17 A D
2. 5 18 B F
3. 6 19 C G
4. 5 20 D H
5. 4 20 K Rt
6. 6 17 J N
7. 6 19 H M
8. 7 20 G L
9. 6 18 F K
10. 8 19 E I

Series 136
1. 9 20 K Rt
2. 11 21 D Lt
3. 10 23 A E
4. 11 25 J N
5. 12 26 C G
6. 13 25 I M
7. 13 26 D I
8. 14 27 G L
9. 15 29 F J
10. 4 22 E H

Series 137
1. 11 26 K N
2. 8 27 I L
3. 6 24 G K
4. 3 23 E H
5. 10 30 C G
6. 15 30 C Lt
7. 8 26 A D
8. 4 28 C F
9. 3 26 B E
10. 2 29 F I

Series 138
1. 30 B Lt
2. 30 B D
3. 30 D H
4. 30 M Rt
5. 30 K M
6. 30 I K
7. 30 H J
8. 30 F H
9. 30 J H
10. Entire Page

Multiplication Drills

Multiplication by 2

Series 139
1. 5 C Lt
2. 6 A E
3. 5 L Rt
4. 6 K N
5. 5 I M
6. 7 H K
7. 6 G J
8. 5 E I
9. 6 D H
10. 7 B E

Series 140
1. 2 7 L Rt
2. 3 8 K N
3. 2 8 I M
4. 3 9 H K
5. 2 9 G J
6. 3 10 F I
7. 2 8 D H
8. 3 9 C G
9. 2 8 B F
10. 3 10 C Lt

Series 141
1. 4 10 C Lt
2. 3 9 B E
3. 4 9 C G
4. 5 10 D H
5. 4 9 E I
6. 3 9 F J
7. 4 10 G K
8. 5 12 I L
9. 6 11 J M
10. 9 13 L Rt

Series 142
1. 9 14 C Lt
2. 10 15 L Rt
3. 8 14 K N
4. 11 17 J M
5. 12 18 H L
6. 10 16 G J
7. 12 19 F I
8. 13 20 E H
9. 14 21 C F
10. 15 22 B Lt

Series 143
1. 14 20 F I
2. 15 21 E H
3. 14 22 D F
4. 15 22 B E
5. 16 21 A D
6. 17 24 C Lt
7. 19 26 H J
8. 20 25 I L
9. 22 28 J M
10. 24 30 L Rt

Multiplication by 3

Series 144
1. 5 C Lt
2. 6 A D
3. 4 B E
4. 6 C F
5. 5 D G
6. 7 F H
7. 6 G K
8. 5 I L
9. 6 L Rt
10. 5 K N

Series 145
1. 2 6 L R
2. 3 8 K N
3. 2 7 J M
4. 3 9 I L
5. 2 8 H K
6. 2 7 G J
7. 3 8 F I
8. 4 10 D H
9. 3 9 C F
10. 2 8 A D

Series 146
1. 4 9 C Lt
2. 5 10 A D
3. 4 10 B F
4. 5 11 C G
5. 6 12 E H
6. 4 11 F I
7. 6 13 G J
8. 7 13 H K
9. 6 12 I L
10. 7 13 L Rt

Series 147
1. 8 13 F I
2. 7 12 G K
3. 9 15 I L
4. 10 16 J M
5. 11 17 K N
6. 10 18 M Rt
7. 12 19 E H
8. 13 20 D G
9. 14 21 C F
10. 16 22 A D

Series 148
1. 18 23 C Lt
2. 17 24 A D
3. 19 25 B E
4. 20 26 C F
5. 21 27 D G
6. 22 25 E I
7. 23 29 G J
8. 24 29 H K
9. 21 28 J M
10. 24 30 L Rt

Multiplication Drills

Multiplication by 13

	Series 149	Series 150	Series 151	Series 152	Series 153
1.	4 L Rt	3 7 C Lt	8 10 L Rt	12 16 E H	18 23 C F
2.	5 K N	4 8 B F	7 12 J M	13 19 D G	19 28 A C
3.	6 I L	3 8 D G	8 13 C Lt	17 22 C F	20 25 C Lt
4.	5 H K	4 9 E H	9 14 A D	18 24 B E	21 26 D G
5.	7 G J	4 10 F I	10 15 B E	19 25 A D	22 27 F I
6.	6 F I	3 10 H J	9 16 D F	20 26 D Lt	23 28 G J
7.	4 D H	4 11 I L	11 16 E H	18 24 F I	24 28 H L
8.	5 C F	5 10 J M	12 17 F I	19 25 G J	25 30 J M
9.	4 B E	4 9 K N	10 16 G J	21 26 I K	23 27 K N
10.	5 C Lt	3 8 L Rt	13 18 H K	20 25 J M	24 29 L Rt

Multiplication by $3\frac{1}{3}$

Annex cipher, divide by 3

	Series 154	Series 155	Series 156
1.	3 C Lt	3 6 C Lt	6 9 C Lt
2.	4 A D	3 6 C F	6 9 L Rt
3.	4 B E	4 7 B E	5 8 C F
4.	3 C G	4 7 L Rt	6 9 H K
5.	4 D G	2 5 D G	4 8 E G
6.	4 E H	3 6 G K	6 12 F E
7.	4 L Et	3 6 I L	7 12 M Rt
8.	5 K N	4 7 K N	8 12 H K
9.	6 B Lt	4 8 F H	9 13 G J
10.	4 H K	4 9 H K	8 14 A C

Multiplication by $33\frac{1}{3}$

Annex two ciphers, divide by 3

	Series 157	Series 158	Series 159
1.	10 13 C Lt	18 21 B E	3 C Lt
2.	10 14 B E	19 22 C F	5 B Lt
3.	9 13 E G	20 25 F H	4 B D
4.	12 16 L Rt	20 26 M Rt	5 D G
5.	11 15 I K	22 25 E H	6 E G
6.	14 18 E G	25 30 B Lt	6 H K
7.	14 19 J L	24 28 C E	4 L Rt
8.	15 18 F I	26 30 I K	5 K N
9.	16 20 H K	23 27 D G	
10.	15 21 K N	24 30 F I	

Multiplication by 4

	Series 160	Series 161	Series 162	Series 163	Series 164
1.	5 L Rt	3 8 C Lt	6 10 D Lt	11 16 C Lt	19 26 C Lt
2.	6 K N	3 8 B F	5 11 C G	12 16 K Rt	21 27 L Rt
3.	5 C Lt	2 6 A E	8 12 K Rt	13 18 B F	23 28 A D
4.	4 A E	4 9 K Rt	9 15 I L	12 18 F I	24 30 C F
5.	6 C F	3 7 H L	10 14 E I	14 20 J M	26 30 E I
6.	7 D G	2 8 E I	11 16 C F	15 20 A E	25 30 J N
7.	5 E H	3 9 B E	12 16 G K	16 22 L Rt	22 28 I L
8.	6 F I	4 8 K Rt	13 17 I L	15 21 H K	20 30 B D
9.	4 J M	3 7 C G	10 16 H K	22 26 A D	24 28 D H
10.	5 I L	4 8 G J	14 18 C G	20 25 C G	22 29 H K

Multiplication by 14

	Series 165	Series 166	Series 167	Series 168	Series 169
1.	4 C Lt	2 6 C Lt	6 12 A D	14 18 C Lt	22 26 A D
2.	4 A D	3 7 B E	7 13 C E	15 20 B E	23 28 C E
3.	5 D G	2 7 D H	8 12 D H	14 20 D F	25 30 L Rt
4.	4 L Rt	2 6 G J	9 14 F I	16 21 E H	24 28 D G
5.	6 C F	3 8 I M	10 15 H K	16 22 I K	24 30 F H
6.	5 E H	2 8 L Rt	9 16 J L	20 25 L Rt	26 30 G K
7.	4 F J	4 8 C F	11 16 K N	19 26 J L	23 29 J L
8.	6 I K	5 9 A E	10 16 L Rt	18 24 G I	24 30 K N
9.	5 J M	4 10 E G	13 17 C Lt	22 26 A D	20 30 I K
10.	5 L Rt	5 10 H K	12 16 L Rt	20 28 B Lt	27 30 J Rt

Multiplication Drills

Multiplication by 2½

Annex a cipher, divide by 4

	Series 170	Series 171
1.	3 C Lt	4 8 C Lt
2.	4 A D	3 7 B E
3.	4 B E	5 9 C G
4.	5 D F	4 8 L Rt
5.	4 E H	6 10 C F
6.	6 G I	7 12 E G
7.	3 H L	6 11 H K
8.	4 J M	9 14 K N
9.	5 K N	4 9 J M
10.	4 K Rt	6 10 F I

Multiplication by 25

Annex two ciphers, divide by 4

	Series 172	Series 173	Series 174
1.	10 14 B Lt	15 20 B Lt	20 24 B Lt
2.	11 15 B D	14 18 A C	21 25 A C
3.	10 15 C E	16 22 B E	22 26 L Rt
4.	12 16 L Rt	17 23 D F	23 28 I L
5.	14 18 H J	18 24 E H	24 29 F H
6.	15 20 E G	20 24 G I	22 27 D G
7.	14 19 I K	21 25 H K	25 30 A C
8.	16 20 K N	22 26 J L	26 30 D F
9.	14 20 D F	23 27 K N	24 30 E H
10.	17 22 F H	22 27 L Rt	23 29 G J

Multiplication by 5

	Series 175	Series 176	Series 177	Series 178	Series 179
1.	5 C Lt	3 7 A D	7 12 L Rt	14 18 L Rt	21 25 A D
2.	4 B F	4 8 E F	6 12 K M	15 20 C Lt	25 30 C Lt
3.	5 L Rt	3 8 C G	8 13 H K	16 20 A D	24 30 C E
4.	4 C G	5 9 K Rt	9 15 F H	17 23 C E	23 27 D G
5.	6 E H	4 8 H K	10 15 D G	18 24 D G	24 30 F I
6.	5 F I	3 8 E H	9 14 C F	19 23 E H	25 28 K Rt
7.	6 G J	4 9 C F	11 16 C Lt	20 24 F J	26 30 G J
8.	4 F J	5 10 A D	10 16 B D	20 25 H K	24 29 I L
9.	5 I L	4 10 B Lt	12 17 C F	21 26 I L	25 30 K N
10.	4 J N	3 10 M Rt	13 18 E G	20 28 K M	22 29 B D

Multiplication by 15

	Series 180	Series 181	Series 182	Series 183	Series 184
1.	4 L Rt	2 6 L Rt	5 10 C Lt	10 14 L Rt	17 22 C Lt
2.	4 J M	3 7 J M	4 10 A D	12 16 K N	19 23 A E
3.	5 I L	2 7 H F	6 12 C F	13 18 I L	20 25 C F
4.	5 C Lt	3 8 F I	5 11 D G	14 20 H J	21 27 E G
5.	4 B D	2 7 D H	7 12 E I	14 19 F I	22 28 F I
6.	5 C F	3 8 C F	8 13 G J	15 20 E I	23 30 H J
7.	6 E G	4 8 B E	7 14 I K	16 21 D G	24 29 I L
8.	4 F J	4 9 C Lt	8 12 I M	17 23 C E	22 29 J M
9.	5 H K	3 9 A C	9 15 K N	18 24 B E	25 30 K N
10.	6 J L	5 10 D G	8 14 L Rt	16 22 B Lt	26 30 K Rt

Division by 5

	Series 185	Series 186	Series 187	Series 188	Series 189
1.	5 D Lt	2 7 K Rt	5 10 E Lt	12 16 D Lt	21 26 K Rt
2.	4 B F	3 8 J N	4 10 B F	13 18 A F	22 27 I N
3.	5 C G	2 8 I M	6 11 C G	13 20 C G	23 28 H L
4.	6 D H	3 9 G K	5 11 D I	14 20 D H	22 29 G K
5.	5 E J	4 9 E J	4 10 E J	15 21 E J	23 29 E J
6.	6 G L	2 8 D I	7 12 F K	16 22 F K	24 28 D I
7.	5 I M	3 9 C H	8 13 G K	17 24 G K	25 30 C H
8.	6 K Rt	4 9 B F	9 14 H L	18 24 H L	24 30 B F
9.	7 K N	4 10 D Lt	10 15 I M	19 26 I M	23 29 A E
10.	6 J M	3 10 A E	11 15 J Rt	20 25 J Rt	24 30 D Lt

Multiplication Drills

Multiplication by 6

Series 190

1. 5 L Rt
2. 4 J N
3. 6 I M
4. 5 G K
5. 6 F J
6. 5 E H
7. 6 C G
8. 7 B E
9. 4 A F
10. 5 D Lt

Series 191

1. 2 6 K Rt
2. 3 8 J M
3. 2 8 H L
4. 3 9 G K
5. 4 9 F J
6. 5 10 E H
7. 3 9 C G
8. 4 10 B E
9. 2 9 A D
10. 3 8 C Lt

Series 192

1. 4 10 C Lt
2. 5 11 A D
3. 6 12 B F
4. 7 13 D G
5. 8 14 E H
6. 9 13 F J
7. 10 16 H K
8. 11 16 I L
9. 12 17 J M
10. 13 18 K Rt

Series 193

1. 14 18 K Rt
2. 15 20 J M
3. 13 19 I L
4. 14 20 H L
5. 16 21 G J
6. 18 24 F I
7. 17 24 E H
8. 16 22 D G
9. 18 25 C F
10. 17 24 C Lt

Series 194

1. 19 23 D Lt
2. 18 25 A D
3. 19 26 B E
4. 20 25 C G
5. 22 28 E H
6. 24 30 F I
7. 23 29 G K
8. 26 30 H L
9. 24 29 J M
10. 25 30 L Rt

Multiplication by 16

Series 195

1. 4 L Rt
2. 4 J M
3. 5 I L
4. 4 C Lt
5. 5 B E
6. 6 E F
7. 5 D G
8. 4 E I
9. 6 G J
10. 5 H K

Series 196

1. 2 6 C Lt
2. 3 8 A D
3 2 7 B E
4. 3 8 L Rt
5. 2 8 J M
6. 3 7 H L
7. 4 8 G J
8. 2 8 F I
9. 3 8 E H
10. 4 9 C F

Series 197

1. 5 10 C Lt
2. 4 10 A D
3. 6 12 C F
4. 5 11 D G
5. 7 12 E H
6. 6 12 L Rt
7. 5 12 K M
8. 5 11 H K
9. 6 12 G J
10. 4 11 F H

Series 198

1. 10 14 L Rt
2. 12 16 K N
3. 13 18 I L
4. 14 20 H J
5. 12 17 E H
6. 14 19 F I
7. 15 20 D H
8. 16 21 C F
9. 18 24 B E
10. 15 21 A D

Series 199

1. 17 22 C Lt
2. 19 23 A E
3. 20 25 C F
4. 21 26 D G
5. 23 29 F I
6. 24 30 G J
7. 22 28 L Rt
8. 20 27 K M
9. 24 30 I L
10. 22 30 G I

Multiplication by 1⅔

Annex a cipher, divide by 6.

Series 200

1. 5 C Lt
2. 4 B F
3. 5 C G
4. 6 D H
5. 6 E J
6. 5 G L
7. 6 I N
8. 5 K Rt
9. 6 K N
10. 7 J M

Series 201

1. 2 8 K Rt
2. 3 8 J N
3. 2 8 I M
4. 3 9 G K
5. 4 9 E J
6. 3 8 D I
7. 3 9 C H
8. 4 9 B F
9. 4 10 D Lt
10. 3 10 A E

Series 202

1. 5 10 B Lt
2. 4 10 B E
3. 6 11 C F
4. 5 11 D G
5. 4 10 E H
6. 7 12 F I
7. 8 13 G J
8. 9 14 H K
9. 10 15 I L
10. 11 16 K Rt

Series 203

1. 21 26 K Rt
2. 22 27 J M
3. 23 28 I L
4. 22 29 G J
5. 23 29 F I
6. 24 30 E H
7. 25 30 D G
8. 23 29 C G
9. 22 28 B F
10. 24 30 A D

Series 204

1. 12 16 L Rt
2. 13 18 J N
3. 13 20 I L
4. 14 20 G K
5. 15 21 E I
6. 16 22 D G
7. 17 24 C F
8. 18 24 H K
9. 19 26 B E
10. 20 26 D Lt

Series 205

1. 21 26 K Rt
2. 22 27 J M
3. 23 28 I L
4. 22 29 G J
5. 23 29 F I
6. 24 30 E H
7. 25 30 D G
8. 23 29 C G
9. 22 28 B F
10. 24 30 A D

Multiplication by 7

Series 206

1. 4 L Rt
2. 6 K N
3. 5 I M
4. 6 H L
5. 7 G J
6. 6 F I
7. 8 E H
8. 7 C G
9. 6 B F
10. 7 C Lt

Series 207

1. 2 8 E H
2. 3 9 D G
3. 2 9 C F
4. 3 10 B E
5. 2 10 C Lt
6. 4 9 F J
7. 3 10 H K
8. 4 12 L Rt
9. 3 11 I K
10. 5 10 J N

Series 208

1. 6 12 I L
2. 5 11 H K
3. 7 14 L Rt
4. 6 13 K N
5. 8 14 C Lt
6. 9 16 B E
7. 10 14 G L
8. 11 16 F J
9. 12 18 D G
10. 13 19 A D

Series 209

1. 14 20 K N
2. 15 21 L Rt
3. 13 20 J M
4. 16 20 H L
5. 17 22 G K
6. 18 23 F I
7. 19 25 E H
8. 20 26 D G
9. 21 28 C Lt
10. 22 27 A E

Series 210

1. 23 28 A D
2. 22 29 B E
3. 21 28 L Rt
4. 22 27 J N
5. 23 29 I L
6. 24 30 H K
7. 20 25 F J
8. 21 29 E G
9. 22 28 C F
10. 23 29 C Lt

Multiplication Drills

Multiplication by 17

	Series 211		Series 212		Series 213		Series 214		Series 215
1.	4 L Rt	1.	2 6 C Lt	1.	5 10 C Lt	1.	9 14 L Rt	1.	17 22 C Lt
2.	4 J M	2.	2 8 A D	2.	4 11 A D	2.	12 16 K N	2.	19 24 A E
3.	5 I L	3.	2 7 B E	3.	6 12 C F	3.	13 17 I L	3.	20 25 C F
4.	6 C Lt	4.	3 8 L Rt	4.	5 11 D G	4.	14 20 H J	4.	21 26 D G
5.	5 D G	5.	2 7 J M	5.	7 12 E H	5.	12 17 E H	5.	23 29 F I
6.	4 E I	6.	3 7 H L	6.	5 12 L Rt	6.	14 19 F I	6.	25 30 G J
7.	5 G J	7.	4 8 G J	7.	6 12 K M	7.	15 21 D H	7.	22 28 L Rt
8.	6 H K	8.	2 8 F I	8.	5 11 H K	8.	16 21 C F	8.	20 26 K M
9.	5 B E	9.	3 9 E H	9.	6 12 G J	9.	18 24 B E	9.	24 30 I L
10.	6 C F	10.	4 9 C F	10.	4 11 F H	10.	15 21 A D	10.	25 30 G I

Multiplication by 14⅔

Annex cipher, divide by 7.

	Series 216		Series 217		Series 218		Series 219		Series 220
1.	4 C Lt	1.	2 7 L Rt	1.	5 10 B Lt	1.	11 16 L Rt	1.	20 25 K Rt
2.	5 B D	2.	3 8 J M	2.	4 10 B E	2.	14 18 J N	2.	22 27 J M
3.	6 C F	3.	2 7 I L	3.	6 11 C F	3.	13 19 I L	3.	23 29 I L
4.	5 D G	4.	3 9 G J	4.	6 12 D G	4.	14 20 G K	4.	22 29 G J
5.	6 E H	5.	4 9 F I	5.	5 10 E H	5.	15 21 E I	5.	23 28 F I
6.	6 G J	6.	5 9 H J	6.	7 12 F I	6.	16 21 D G	6.	24 30 E H
7.	5 I L	7.	2 8 E H	7.	8 14 G J	7.	17 24 C F	7.	25 29 D G
8.	6 L Rt	8.	3 9 C F	8.	9 15 H K	8.	19 25 H K	8.	22 27 C E
9.	5 K N	9.	2 7 B E	9.	10 14 I L	9.	19 26 B E	9.	22 28 B F
10.	7 J M	10.	3 8 A D	10.	11 16 K Rt	10.	20 26 D Lt	10.	24 30 A D

Multiplication by 8

	Series 221		Series 222		Series 223		Series 224		Series 225
1.	4 L Rt	1.	2 8 E H	1.	6 12 I L	1.	15 20 K N	1.	23 28 A D
2.	6 K N	2.	3 9 D G	2.	5 11 H K	2.	15 21 L Rt	2.	22 29 B E
3.	5 I M	3.	2 9 C F	3.	7 13 L Rt	3.	13 20 J M	3.	21 27 L Rt
4.	6 H L	4.	3 10 B E	4.	6 13 K N	4.	16 21 H L	4.	22 27 J N
5.	7 G J	5.	2 10 C Lt	5.	8 14 C Lt	5	17 22 G K	5.	23 29 I L
6.	6 F I	6.	4 9 F J	6.	9 16 B E	6.	18 23 F I	6.	24 30 H K
7.	8 E H	7.	3 10 H K	7.	10 14 G L	7.	19 25 E H	7.	20 25 F J
8.	6 C G	8.	4 11 L Rt	8.	11 16 F J	8.	20 26 D G	8.	21 29 E G
9.	6 B F	9.	3 10 I K	9.	12 18 D G	9.	21 28 C Lt	9.	22 28 C F
10.	7 C Lt	10.	5 10 J N	10.	13 19 A D	10.	22 27 A E	10.	23 29 C Lt

Multiplication by 18

	Series 226		Series 227		Series 228		Series 229		Series 230
1.	5 L Rt	1.	2 7 C Lt	1.	5 10 C Lt	1.	10 14 L Rt	1.	17 22 C Lt
2.	4 J M	2.	3 8 A D	2.	4 10 A D	2.	12 16 K N	2.	19 23 A E
3.	5 I L	3.	2 7 B E	3.	6 12 C F	3.	13 18 I L	3.	20 25 C F
4.	6 C Lt	4.	3 8 L Rt	4.	5 11 D G	4.	14 20 H J	4.	21 26 D G
5.	5 B E	5.	2 8 J M	5.	7 12 E H	5.	12 17 E H	5.	23 30 F I
6.	6 C F	6.	3 7 H L	6.	6 12 L Rt	6.	14 19 F I	6.	24 30 G J
7.	5 D G	7.	4 8 G J	7.	5 12 K M	7.	15 20 D H	7.	22 28 L Rt
8.	4 E I	8.	2 8 F I	8.	5 11 H K	8.	16 21 C F	8.	20 27 K M
9.	6 G J	9.	3 9 E H	9.	6 12 G J	9.	18 25 B E	9.	24 30 I L
10.	5 H K	10.	4 9 C F	10.	4 11 F H	10.	15 21 A D	10.	22 29 G I

Multiplication by 1¼

Annex cipher, divide by 8.

	Series 231		Series 232		Series 233		Series 234		Series 235
1.	4 C Lt	1.	3 8 C Lt	1.	9 14 C Lt	1.	14 20 B Left	1.	20 24 B Lt
2.	5 A D	2.	4 8 C F	2.	10 15 A D	2.	15 21 A C	2.	21 26 A C
3.	6 B E	3.	3 9 B E	3.	9 15 C E	3.	16 22 B E	3.	22 28 L Rt
4.	4 C G	4.	4 10 L Rt	4.	11 17 L Rt	4.	17 23 D G	4.	23 29 I L
5.	6 D G	5.	2 8 D G	5.	13 18 H K	5.	18 24 E H	5.	22 29 F H
6.	5 E H	6.	3 8 G K	6.	14 20 E G	6.	20 25 G I	6.	21 27 D G
7.	6 L Rt	7.	4 10 I L	7.	13 19 I L	7.	21 26 H K	7.	25 30 A C
8.	5 K N	8.	4 9 K N	8.	15 21 K N	8.	22 28 J L	8.	24 30 D F
9.	6 B Left	9.	3 8 J M	9.	14 20 D F	9.	23 27 K N	9.	23 29 E H
10.	4 H K	10.	5 10 F I	10.	16 22 F H	10.	22 27 L Rt	10.	22 26 G J

Multiplication Drills

Multiplication by 9

	Series 236	Series 237	Series 238	Series 239	Series 240
1.	5 L Rt	2 8 E H	6 11 I L	15 20 K N	23 28 A D
2.	6 K N	3 9 D G	5 11 H K	15 21 L Rt	22 28 B E
3.	6 I M	2 8 C F	7 13 L Rt	13 20 J M	21 28 L Rt
4.	5 H L	3 10 B E	6 13 K N	16 20 H L	22 27 J N
5.	7 G J	2 10 C Lt	8 13 C Lt	17 22 G K	23 29 I L
6.	6 F I	4 9 F J	9 15 B E	18 24 F I	24 30 H K
7.	8 E H	3 9 H K	10 14 G L	19 25 E H	20 25 F J
8.	7 C G	4 11 L Rt	11 16 F J	20 25 D G	21 28 E G
9.	6 B F	3 10 I K	12 17 D G	21 27 C Lt	22 27 C F
10.	7 C Lt	5 10 J N	13 18 A D	22 27 A E	23 29 C Lt

Multiplication by 19

	Series 241	Series 242	Series 243	Series 244	Series 245
1.	4 L Rt	2 6 C Lt	5 9 C Lt	9 14 L Rt	17 22 C Lt
2.	4 J M	2 7 A D	4 10 A D	12 16 K N	19 23 A E
3.	5 I L	2 8 B E	6 11 C F	13 18 I L	20 25 C F
4.	5 C Lt	3 8 L Rt	5 10 D G	14 20 H J	21 26 D G
5.	4 B E	2 7 J N	7 12 E H	12 18 E H	23 28 F I
6.	6 C F	3 7 H L	5 11 L Rt	14 18 F I	25 30 G J
7.	5 D G	4 8 C J	6 12 K M	15 20 D H	22 27 L Rt
8.	4 E I	2 7 F L	5 11 H K	16 21 C F	20 26 K M
9.	5 G J	3 8 E H	6 12 G J	18 23 B E	25 30 I L
10.	6 H K	4 9 C F	4 10 F H	15 21 A D	24 29 G I

Multiplication by 11⅑

Annex two ciphers, divide by 9.

	Series 246	Series 247	Series 248	Series 249	Series 250
1.	4 C Lt	2 6 L Rt	5 9 B Lt	11 15 L Rt	20 24 L Rt
2.	4 B D	3 8 J M	4 9 B E	14 18 J N	22 26 J L
3.	5 C F	2 6 I L	6 10 C F	13 18 I L	23 28 J K
4.	5 D G	3 8 G J	6 11 D G	14 18 G K	22 27 G J
5.	4 E H	4 9 F I	5 10 E H	16 20 D G	23 28 F I
6.	5 G J	5 9 H J	7 11 F I	15 19 E I	24 29 E G
7.	4 I L	2 7 E H	8 13 G J	17 22 C F	25 29 D G
8.	5 L Rt	3 7 C F	9 14 H K	19 23 H K	22 27 C E
9.	4 K N	2 6 B E	10 14 I L	19 24 B E	22 28 B D
10.	5 J M	3 8 A D	11 15 K Rt	20 24 C Lt	24 30 A C

Multiplication by 11

	Series 251	Series 252	Series 253	Series 254	Series 255
1.	6 L Rt	2 8 E H	6 10 I L	15 20 K N	22 28 A D
2.	7 K N	2 9 D G	5 11 H K	15 21 L Rt	23 29 B E
3.	5 I M	2 8 C F	7 13 L Rt	13 20 J M	21 28 L Rt
4.	6 H L	3 9 B E	6 13 K N	16 20 H K	22 27 J N
5.	6 G K	2 10 C Lt	8 14 C Lt	17 23 G J	24 29 I L
6.	7 F I	4 9 F J	9 15 B E	18 24 F J	23 30 H K
7.	8 E H	3 9 H K	10 14 G K	19 25 E H	20 25 F J
8.	5 C G	4 10 L Rt	11 16 F I	20 26 D G	21 28 E H
9.	5 B F	3 10 I L	12 17 D G	21 27 D Lt	22 27 C F
10.	7 C Lt	5 10 J N	13 18 A E	23 27 A E	23 30 C Lt

Multiplication by 12

	Series 256	Series 257	Series 258	Series 259	Series 260
1.	4 L Rt	2 7 E H	6 10 I L	15 20 K N	22 28 A E
2.	6 K N	3 8 D G	5 11 H K	14 20 L Rt	23 27 B E
3.	5 I M	2 8 C F	7 13 L Rt	13 20 J M	21 28 L Rt
4.	5 H L	3 10 B E	6 12 K N	16 21 H L	22 27 J M
5.	6 G J	2 9 C Lt	8 13 C Lt	17 22 G K	23 29 I L
6.	6 F I	4 10 F J	9 14 B E	18 25 F I	24 30 H K
7.	8 E H	3 9 H K	10 14 G L	19 24 E H	20 25 F I
8.	6 C G	4 11 L Rt	11 16 F J	20 25 D G	21 28 E G
9.	6 B F	3 9 I K	12 16 D G	21 26 C Lt	22 27 C F
10.	7 B Lt	5 10 J N	13 19 A D	22 27 A D	22 29 C Lt

Short Methods in Multiplication

Aliquot Parts

The learner should commit to memory the following tables so thoroughly that the aliquot parts can be named without the least hesitation when the fraction is given, and vice versa.

Aliquot parts of 10

$1\frac{1}{9}=\frac{1}{9}$
$1\frac{1}{4}=\frac{1}{8}$
$1\frac{3}{7}=\frac{1}{7}$
$1\frac{2}{3}=\frac{1}{6}$
$2\frac{1}{2}=\frac{1}{4}$
$3\frac{1}{3}=\frac{1}{3}$
. $=\frac{1}{2}$

Aliquot parts of 100

$6\frac{1}{4}=\frac{1}{16}$
$8\frac{1}{3}=\frac{1}{12}$
$12\frac{1}{2}=\frac{1}{8}$
$14\frac{2}{7}=\frac{1}{7}$
$16\frac{2}{3}=\frac{1}{6}$
$18\frac{3}{4}=\frac{3}{16}$ or
$\frac{1}{8}+(\frac{1}{2}$ of $\frac{1}{8})$
$25=\frac{1}{4}$
$31\frac{1}{4}=\frac{5}{16}$ or
$\frac{1}{4}+(\frac{1}{4}$ of $\frac{1}{4})$
$33\frac{1}{3}=\frac{1}{3}$
$37\frac{1}{2}=\frac{3}{8}$ or
$\frac{1}{4}+(\frac{1}{2}$ of $\frac{1}{4})$
$50=\frac{1}{2}$
$62\frac{1}{2}=\frac{5}{8}$ or
$\frac{1}{2}+(\frac{1}{4}$ of $\frac{1}{2})$
$75=\frac{3}{4}$ or
$\frac{1}{2}+(\frac{1}{2}$ of $\frac{1}{2})$
$87\frac{1}{2}=\frac{7}{8}$ or
$\frac{1}{2}+\frac{1}{4}+\frac{1}{8}$

Aliquot parts of 1,000

$83\frac{1}{3}=\frac{1}{12}$
$125=\frac{1}{8}$
$166\frac{2}{3}=\frac{1}{6}$
$250=\frac{1}{4}$
$333\frac{1}{3}=\frac{1}{3}$
$375=\frac{3}{8}$ or
$\frac{1}{4}+(\frac{1}{2}$ of $\frac{1}{4})$
$625=\frac{5}{8}$ or
$\frac{1}{2}+(\frac{1}{4}$ of $\frac{1}{2})$
$833\frac{1}{3}=\frac{5}{6}$ o
$\frac{1}{2}+\frac{1}{3}$
$875=\frac{7}{8}$ or
$\frac{1}{2}+\frac{1}{4}+\frac{1}{8}$

Multiplication by Aliquots

To multiply any number by

10	annex	a cipher.
100	"	two ciphers.
1000	"	three ciphers.
10000	"	four "
100000	"	five "
$1\frac{1}{4}$	"	a cipher and divide by 8.
$1\frac{2}{3}$	"	" " " " 6.
$2\frac{1}{2}$	"	" " " " 4.
$3\frac{1}{3}$	"	" " " " 3.
$6\frac{1}{4}$	"	two ciphers and divide by 16.
$8\frac{1}{3}$	"	" " " " " 12.
$12\frac{1}{2}$	"	" " " " " 8.
$14\frac{2}{7}$	"	" " " " " 7.
$16\frac{2}{3}$	"	" " " " " 6.
25	"	" " " " " 4.
$33\frac{1}{3}$	"	" " " " " 3.
50	"	" " " " " 2.
$66\frac{2}{3}$	"	" " " subtract $\frac{1}{3}$ of the product.
75	"	" " " deduct $\frac{1}{4}$ "
$87\frac{1}{2}$	"	" " " " $\frac{1}{8}$ " "
$37\frac{1}{2}$	"	" " " take $\frac{3}{8}$ " "
$62\frac{1}{2}$	"	" " " " $\frac{5}{8}$ " .
$112\frac{1}{2}$	"	" " " add $\frac{1}{8}$ " "
125	"	three ciphers " divide by 8.
$133\frac{1}{3}$	"	two " " add $\frac{1}{3}$ of the product.
$137\frac{1}{2}$	"	" " " " $\frac{3}{8}$ " "
150	"	" " " " $\frac{1}{2}$ " "
$162\frac{1}{2}$	"	" " " " $\frac{5}{8}$ " "
$166\frac{2}{3}$	"	three " " divide by 6.
175	"	two " " multiply by 2 and deduct $\frac{1}{8}$ of the product.
$187\frac{1}{2}$	"	" " " " " 2 " $\frac{1}{16}$ "
250	"	three " " divide " 4.

Multiplication by Numbers Near Aliquots

After thoroughly mastering multiplication by aliquots it is a simple step to multiplication by numbers near aliquots.

Multiply 3465 by 254.

4|3465000
866250
4 × 3465=13860
880110

EXPLANATION.—254 is near 250, we therefore multiply our number by 250, by annexing three ciphers and dividing by 4, to this partial product we now add four times the multiplicand and have the product of 3465 by 254.

To Multiply any Number by 11

Examples. Find the product of 72 × 11.

(a) Full operation.

72
11
72
72
792

(b) Contracted operation.

Write 2 in the place of the units of the product. 2+7=9. Write 9 in the place of the tens of the product. Bring down 7 for the place of the hundreds of the product.

The complete product is therefore 792.

2. Find the product of 89 × 11.

Solution.—Write 9 as the first figure of the product. 9 + 8 = 17. Write 7 as the second figure of the product, and carry 1. 8 + 1 = 9. Write 9 as the third figure of the product, thus completing the multiplication and obtaining as a result 979.

3. Find the product of 195 × 11.

Solution.—Write 5 as the first figure in the product. 5 + 9 = 14. Write 4 as the second figure in the product, and carry 1. 9 + 1 + 1 =11. Write 1 as the third figure in the product, and carry 1. 1 + 1 = 2. Write 2 as the fourth figure in the product, thus completing the multiplication and obtaining as a result 2145.

Hence the rule:

Write as the first figure of the product the first figure of the multiplicand.

Beginning at the right of the multiplicand add the units and tens, the tens and hundreds, the hundreds and thousands, and so on.

Finally, bring down the left-hand figure of the multiplicand as the left-hand figure of the product. Carry when necessary

Series 261

Find by inspection the products of

1. 26 × 11
2. 41 × 11
3. 17 × 11
4. 28 × 11
5. 11 × 57
6. 11 × 48
7. 61 × 11
8. 32 × 11
9. 84 × 11
10. 45 × 11
11. 24 × 11
12. 43 × 11
13. 81 × 11
14. 21 × 11
15. 11 × 26
16. 11 × 47
17. 34 × 11
18. 44 × 11
19. 72 × 11
20. 11 × 59
21. 122 × 11
22. 141 × 11
23. 214 × 11
24. 11 × 164
25. 726 × 11
26. 297 × 11
27. 252 × 11
28. 1921 × 11
29. 4218 × 11
30. 9415 × 11

Additional practices may be given by working series 251 to 255 inclusive, keeping the short method in mind.

To Multiply by a Number one part of which is a certain number of times the other part

Example. Find the product of 425 multiplied by 568.

425
568
3400
23800
241400

Solution.—425 × 8 = 3400. Now since 56, the other part of the multiplier, is 7 times 8, if we multiply the 8 times the multiplicand, or 3,400, by 7, we will have 56 times the multiplicand, or 23,800. Adding we get 241,400, the product.

2. Find the product of 12,121 × 12,816.

12121
12816
193936
1551488
155342736

Solution. Multiply 12,121 by 16, result 193,936. Next multiply 193,936 by 8 (128 is 8 times 16), result 1,551,488. Add the two partial products and get the complete product 155,342,736.

Series 262

1. 247 × 124
2. 578 × 369
3. 794 × 217
4. 299 × 427
5. 984 × 486
6. 275 × 459
7. 294 × 248
8. 212 × 364
9. 2154 × 246
10. 1457 × 488
11. 2157 × 279
12. 1397 × 186
13. 2157 × 927
14. 1578 × 936
15. 2147 × 183
16. 7149 × 535
17. 47289 × 436
18. 15791 × 642
19. 45781 × 936
20. 57842 × 848
21. 21975 × 742
22. 41974 × 535
23. 17945 × 749
24. 15795 × 428

To Multiply by the Factors of a Number

Multiply 95 by 32.

Operation.

$$\begin{array}{r} 95 \\ 8 \\ \hline 760 \\ 4 \\ \hline 3040 \end{array}$$

Explanation.—The factors of 32 are 8 and 4. First multiply by 8 and then multiply that product by 4.

Series 263

1. 784 × 36
2. 891 × 72
3. 794 × 77
4. 485 × 99
5. 284 × 56
6. 187 × 64
7. 2956 × 35
8. 2179 × 44
9. 4754 × 108
10. 2816 × 256
11. 4712 × 324
12. 2175 × 192
13. 21754 × 96
14. 17845 × 420
15. 78941 × 144
16. 29715 × 196
17. 49165 × 98
18. 79142 × 625

To Multiply by any Number of Two Figures ending with 1

Ordinary Method

$$\begin{array}{r} 846 \times 41 \\ 3384 \\ \hline 34686 \end{array}$$

Multiply by 4, placing the product one place to the left and add.

Short Method

$$\begin{array}{rlll} 846 & 6 \times 1 & = 6 & \\ 41 & 6 \times 4 \quad + 4 & = 28 & \text{carry } 2 \\ \hline & 4 \times 4 + 2 \text{ (carried)} + 8 & = 26 & \text{''} \quad 2 \\ 34686 & 8 \times 4 + 2 \quad \text{''} & = 34 & \end{array}$$

The student will observe that we place the units figure of the multiplicand as the units figure of the product. Then multiply by 4, and in addition to the ordinary number to be carried, we carry the figure to the left of the figure multiplied.

Series 264

Set down the products in the following problems:

1. 24 × 21
2. 58 × 31
3. 75 × 41
4. 79 × 51
5. 84 × 61
6. 294 × 51
7. 784 × 61
8. 297 × 71
9. 497 × 81
10. 297 × 91
11. 4971 × 21
12. 2894 × 31
13. 7944 × 51
14. 2895 × 61
15. 4721 × 91

Note.—This method may be applied when the multiplier has one or more ciphers between the two figures by writing the product two or more places to the left.

To Multiply by any Number of 9's

Annex to the multiplicand as many ciphers as there are 9's in the multiplier. From this result subtract the multiplicand. The number thus obtained will be the product.

Example. 4568 × 9999 = ?

Solution.—To 4568, the multiplicand, annex four 0's and you will have 45680000. Then 45680000 − 4568 = 45675432, the product.

In the above example there is a saving of sixteen figures and one line—requiring only a little more than half as much work as the ordinary way.

To Multiply any number by a Small Multiplier whose Units Figure is 9

Much time may be saved by multiplying by the next higher number, and from the result subtracting the multiplicand. To illustrate:

637 × 69 = ?
637 × 70 = 44590.
44590 − 637 = 43953

Explanation.—69 is one less than 70, therefore after taking 637, 70 times we take the multiplicand from the product, and have in the remainder 43953, 637 taken 69 times.

Series 265

1. 274 × 29
2. 476 × 49
3. 574 × 89
4. 273 × 79
5. 167 × 69
6. 5762 × 59
7. 2918 × 39
8. 2916 × 99
9. 1654 × 49
10. 1251 × 89
11. 1647 × 999
12. 1543 × 9999.
13. 2164 × 9999
14. 165 × 99999
15. 172 × 999999

To multiply by a number a little less than 100, 1000, etc.

The complement of a number is the difference between that number and 1 in the next highest order. The complement of 7 is 3; of 96 is 4, etc.

Explanation.—The order next above 7, or 7 units, is tens. Then, 1 in tens place is 1 ten, or 10. 10 − 7 = 3, the complement of 7. The order next above 97, or 9 tens and 7 units, is hundreds. 1 in hundreds' place is 1 hundred, or 100. Then 100 − 96 = 4 the complement of 96.

Annex to the multiplicand as many ciphers as there are figures in the multiplier and from this result subtract the product of the multiplicand by the complement of the multiplier.

Example.—2345 × 997 = ?

Solution.—To 2345 annex three ciphers and you will have 2345000. Then 3 being the complement of 997, 2345 × 3 = 7035. 2345000 − 7035 = 2337965, the product.

To multiply by a number a little more than 100, 1000, etc.

The supplement or excess of a number is the difference between that number and 1 in the next lower order.

Explanation.—The supplement of 103 is 3. 1 in the next lower order is 100; 103 − 100 is 3, the supplement.

Annex to the multiplicand as many ciphers as there are figures in the multiplier, less one, and to this result add the product of the multiplicand and the supplement of the multiplier. The result will be the product.

Example.—456 × 102 = ?

Solution.—There are three figures in the multiplier. 3 less 1 = 2. Annexing two ciphers to 456 we have 45600. 45600 + (456 × 2) = 46512, the product.

Series 266

1. 471 × 98
2. 295 × 96
3. 197 × 103
4. 298 × 105
5. 247 × 108
6. 1754 × 296
7. 2954 × 495
8. 1725 × 1012
9. 2175 × 1015
10. 2169 × 1008
11. 47123 × 997
12. 21974 × 795
13. 42196 × 794
14. 21973 × 9993
15. 24789 × 6999

To multiply two numbers, one of which is more and the other less than 100, 1000, etc.

Multiply the sum of the numbers less the unit of comparison by the unit of comparison and from the product subtract the product of the supplement and the complement.

Example.—Multiply 108 by 94.

Unit of comparison is 100.

108....8 supplement.
94....6 complement.

$$\left.\begin{array}{r}10200\\48\end{array}\right\}$$ product of the supplement and complement.

10152

Reason for the process exemplified :

$108 = 100 + 8,\ 94 = 100 - 6.$
Multiply $100 + 8$ by $100 - 6$.

$$\begin{array}{l}100 + 8\\100 - 6\\\hline 100 \times 100 + 8 \times 100\\\qquad - 6 \times 100 - 8 \times 6\\\hline 10000 + 200 - 48\\= 10200 - 48\\= 10152\end{array}$$

Series 267

1. 107 × 96
2. 104 × 94
3. 115 × 88
4. 107 × 94
5. 109 × 92
6. 112 × 92
7. 114 × 96
8. 115 × 93
9. 104 × 87
10. 109 × 88
11. 1014 × 995
12. 1015 × 998
13. 1045 × 993
14. 1025 × 989
15. 1067 × 994

To multiply two numbers, of the same number of figures, over and near 100, 1000, etc.

Rule

From the sum of the numbers subtract the unit of comparison, and to the right of the result write the product of the excesses.

NOTES

1. When there are fewer figures in the product of the excesses than ciphers in the unit of comparison, write ciphers in the result to supply the deficiency.
2. When there are more figures in the product of the excesses than ciphers in the unit of comparison, add the excess on the left hand to the first part of the result.
3. After practice the writing of the complements or the excesses in examples where they are used may be omitted.

Multiply 112 by 106.

Method

$$\begin{array}{rl}112 & \\106 & \\\hline 218 & \text{Sum of numbers.}\\100 & = \text{Unit of comparison.}\\\hline 118 & = \text{Difference.}\\72 & = \text{Product of excesses.}\\\hline 11872 & = \text{Answer.}\end{array}$$

Reason for the process exemplified :

$$\begin{array}{l}100 + 12\\100 + 6\\\hline 100 \times 100 + 12 \times 100\\\qquad + 6 \times 100 + 6 \times 12\\\hline 10000 + 1800 + 72\\= 11872\end{array}$$

Series 268

1. 112 × 107
2. 107 × 104
3. 115 × 106
4. 112 × 109
5. 107 × 108
6. 114 × 113
7. 116 × 108
8. 112 × 109
9. 117 × 114
10. 118 × 112
11. 1007 × 1008
12. 1009 × 1007
13. 1065 × 1012
14. 1124 × 1008
15. 1017 × 1011

To multiply two Numbers, of the same Number of Figures, Under and near 100, 1000, etc.

From either number subtract the complement of the other, and to the right of the result write the product of the complements.

Example 1.—Multiply 94 by 98.

94 ...... 6 complement.
98 ...... 2 complement.
—
9212

Reason for the process exemplified :

100 − 6
100 − 2
————
100 × 100 − 6 × 100
− 2 × 100 + 6 × 2
————
10000 − 800 + 12
= 9200 + 12
= 9212

Series 269

1. 98 × 99
2. 97 × 96
3. 95 × 94
4. 94 × 93
5. 93 × 92
6. 92 × 91
7. 88 × 94
8. 87 × 88
9. 75 × 95
10. 85 × 97
11. 84 × 95
12. 93 × 88
13. 998 × 999
14. 997 × 993
15. 975 × 988
16. 991 × 985
17. 996 × 987
18. 985 × 975

To multiply by means of Cross Multiplication

Note.—To see the reason for any of the following solutions work the question by the ordinary method, putting down every line of the solution. When you do the same work by cross multiplication you will see that it is simply a matter of carrying in your head the work you ordinarily put on paper.

Examples.—1. Find the product of 74 × 23.

74
23
———
1702

Solution.—4 × 3 = 12. Write 2 as the first figure of the product and carry 1. 7 × 3 + 1 (carried) + 8 (4 × 2) = 30. Write 0 as the second figure of the product and carry 3. 7 × 2 + 3 (carried) = 17. Write 17 to the left of the figures already written in the product, thus completing the multiplication and obtaining a product of 1702.

2. Find the product of 124 × 62

124
62
———
7688

Solution.—4 × 2 = 8. Write 8 as the first figure of the product. 2 × 2 + 24 (4 × 6) = 28. Write 8 as the second figure of the product and carry 2. 1 × 2 + 12 (2 × 6) + 2 (carried) = 16. Write 6 as the third figure of the product and carry 1. 1 × 6 + 1 (carried) = 7. Write 7 as the fourth figure of the product, thus completing the multiplication and obtaining a product of 7688.

3. Find the product of 2146 × 32.

2146
32
———
68672

Solution.—6 × 2 = 12. Write 2 and carry 1. 4 × 2 + 1 (carried) + 18 (6 × 3) = 27. Write 7 and carry 2. 1 × 2 + 2 (carried) + 12 (4 × 3) = 16. Write 6 and carry 1. 2 × 2 + 1 (carried) + 3 (1 × 3) = 8. Write 8. 2 × 3 = 6. Write 6, thus completing the multiplication and obtaining a product of 68672.

4. Find the product of 214 × 236.

214
236
50504

Solution.—4 × 6 = 24. Write 4 and carry 2. 1 × 6 + 2 + 12 (4 × 3) = 20. Write 0 and carry 2. 2 × 6 + 2 + 3 (1 × 3) + 8 (4 × 2) = 25. Write 5 and carry 2. 2 × 3 + 2 + 2 (1 × 2) = 10. Write 0 and carry 1. 2 × 2 + 1 = 5. Write 5, thus completing the multiplication and obtaining a product of 50504.

Series 270

1. 74 × 26
2. 97 × 44
3. 33 × 27
4. 48 × 46
5. 79 × 52
6. 15 × 75
7. 27 × 68
8. 79 × 47
9. 28 × 54
10. 75 × 35
11. 175 × 34
12. 261 × 73
13. 485 × 56
14. 697 + 28
15. 441 × 56
16. 247 × 87
17. 478 × 56
18. 278 × 87
19. 224 × 58
20. 976 × 47
21. 7172 × 26
22. 1478 × 55
23. 4196 × 74
24. 2198 × 57
25. 5164 × 26
26. 214 × 175
27. 518 × 169
28. 297 × 479
29. 598 × 294
30. 197 × 596

To the Teacher

Unlimited practice may be given in this very important work by blocking out questions on any of the multiplication pages. For instance, we might give an indication that will block out a question four columns wide with the understanding that the figures of the first two columns are to be multiplied by the figures of the second two columns. Again, a question six columns wide may be blocked out and the first three figures multiplied by the second three, and so on.

Extensions of the Cross Multiplication Idea

1. To Multiply two Numbers in which the units figures added make 10, the other figures being the same in each

For the two right hand figures of the entire product write the product of the units. Add 1 to the tens' figure of the multiplier, multiply the tens' figure of the multiplicand by the sum thus obtained, and prefix this product to the figures derived from multiplying the units.

The number thus obtained will be the required product.

What is the product of 76 multiplied by 74 ?

76
74
5624

Solution.—6 × 4 = 24. Write 24 as the two right hand figures of the entire product. Then, adding 1 to the tens' figure of the multiplier, we have 7 + 1 = 8. 7 × 8 = 56. Prefixing 56 to 24, we have 5624, the entire product.

Multiply 625 by 625 and find the product by this process.

625
625
186
372
390625

Solution.—Disregard the units for the present. Add 1 to the tens figure of the multiplier. Then 62 × 3 = 186. Write 186 as shown. Next multiply by 6 (and all succeeding figures in larger problems) without any change. 62 × 6 = 372. Write 372 as indicated. Add the partial products and to their sum annex the product of the units' figure.

Should the product of the units be less than 10, place a cipher to the left of it.

Series 271

1 24 × 26
2. 72 × 78
3. 63 × 67
4. 47 × 43
5. 31 × 39
6. 85 × 85
7. 92 × 98
8. 91 × 99
9. 64 × 66
10. 53 × 57
11. 112 × 118
12. 123 × 127
13. 135 × 135
14. 179 × 171
15. 146 × 144
16. 491 × 499
17. 392 × 398
18. 694 × 696
19. 296 × 294
20. 591 × 599

2. To Multiply two Numbers in which the units figures are the same

Multiply 46 by 66.

Method

46
66
3036

6 × 6 = 36 carry 3
(4 + 6) × 6 + 3 (carried) = 63 carry 6
4 × 6 + 6 (carried) = 30

Series 272

1. 31 × 21
2. 67 × 57
3. 53 × 93
4. 44 × 54
5. 68 × 78
6. 58 × 48
7. 81 × 91
8. 22 × 72
9. 32 × 82
10. 45 × 55
11. 84 × 34
12. 36 × 56
13. 83 × 73
14. 99 × 59
15. 47 × 57
16. 126 × 146
17. 115 × 125
18. 135 × 135
19. 117 × 197
20. 126 × 186

3. To Multiply two Numbers in which the units figures are unlike, the remaining figures being alike

Example 1.—Multiply 78 by 72.

78
72
——
5616

Method
8 × 2 = 16 carry 1
(8 + 2) × 7 + 1 (carried) = 71 carry 7
7 × 7 + 7 (carried) = 56

Example 2.—Multiply 126 by 122.

126
122
———
15372

Method
6 × 2 = 12 carry 1
(6 + 2) × 12 + 1 (carried) = 97 carry 9
12 × 12 + 9 (carried) =153

Series 273

1. 27 × 28
2. 46 × 45
3. 73 × 77
4. 46 × 45
5. 68 × 61
6. 91 × 92
7. 85 × 84
8. 27 × 29
9. 74 × 72
10. 48 × 43
11. 23 × 29
12. 41 × 47
13. 73 × 74
14. 61 × 67
15. 57 × 59
16. 126 × 121
17. 147 × 145
18. 168 × 161
19. 152 × 153
20. 144 × 143

4. To square any number of two figures

To square any number of two figures the method of cross multiplication may be used, or the work may be further contracted as shown in the following example.

Example. Square 72.

72
72
——
5184

Solution. 2 × 2 = 4. Write 4 as the first figure of the product. 14 (7 + 7) × 2 = 28. Write 8 as the second figure of the product, and carry 2. 7 × 7 + 2 = 51. Write 51 to complete the product; or, 2 × 2 = 4. Write 4 as the first figure of the product. 4 (2 + 2) × 7 = 28. Write 8 as the second figure of the product, and carry 2. 7 × 7 + 2 = 51. Write 51 to complete the product.

Series 274

Find the square of

1. 27
2. 36
3. 49
4. 52
5. 87
6. 29
7. 44
8. 82
9. 16
10. 27
11. 91
12. 49
13. 56
14. 74
15. 28
16. 55
17. 62
18. 78
19. 34
20. 87

5. To Multiply any number of two or three figures and ending in 5, by itself.

Multiply $75 by 75

Solution.—7 × (7 + 1) = 56; annex 25, obtaining $5625, the answer.

Multiply the tens' order by itself increased by 1, and annex 25.

Series 275

Find the square of

1. 25
2. 35
3. 45
4. 55
5. 65
6. 75
7. 85
8. 95
9. 105
10 115
11. 125
12. 135
13. 145
14. 155
15. 165
16. 175
17. 185
18. 195
19. 205
20. 305

Short Methods in Division

To Divide one Number by another leaving out the products

Subtract the right hand figure of each product as it is formed. When it is larger than the one above, borrow as in subtraction, and add one more to the next product than you would otherwise have done.

Divide 42343014 by 973.

Ordinary Method.

```
973 ) 42343014 ( 43518
      3892
      ----
       3423
       2919
       ----
        5040
        4865
        ----
         1751
          973
         ----
          7784
          7784
          ----
          0000
```

Leaving out the Products.

```
42343014 | 973
 ----    | -----
  3423   | 43518
  ----
   5040
   ----
   1751
   ----
    7784
    ----
    0000
```

The first quotient figure is 4, by which we multiply. 4 times 3 are 12, which, subtracted from 14 (the next number greater ending with 4), leaves 2. Write two in the remainder and carry 1. 4 times 7 are 28, and 1 carried makes 29, which, subtracted from 33 (the next number greater ending with 3), leaves 4. Write 4 in the remainder and carry 3. 4 times 9 are 36 and 3 carried makes 39, which, subtracted from 42 (the next number greater ending with 2), leaves 4. 4 subtracted from 4 leaves 0. Bring down 3 the next figure in the dividend. So proceed until the division is completed.

Series 276

1. 1728 ÷ 48
2. 2025 ÷ 135
3. 625 ÷ 125
4. 1920 ÷ 160
5. 2268 ÷ 44
6. 109295 ÷ 28
7. 52467 ÷ 19
8. 4762 ÷ 367
9. 250000 ÷ 793
10. 87524 ÷ 31
11. 115680 ÷ 155
12. 29410 ÷ 251
13. 666666 ÷ 2154
14. 93462007 ÷ 1525
15. 500500500 ÷ 1888
16. 21416000 ÷ 5407
17. 11460250 ÷ 999
18. 87629000 ÷ 11181

To Divide when there are ciphers on the right of the divisor

1. Cut off from the right of the dividend as many figures as there are ciphers in the divisor, also cut off the ciphers from the right of the divisor.

2. Find how many times the remaining portion of the divisor is contained in the remaining portion of the dividend.

3. The figures cut off will be the remainder unless there is a difference in dividing in which case annex the figures cut off to that difference for the true remainder.

Problem. Find the quotient of 39862 ÷ 300.

```
300)398—62
   -------
   132 262/300
```

Solution.—Cut off the figures as directed. Then 398 ÷ 3 = 132 with a remainder 2. To the 2, annex the figures of the dividend that were cut off making 262 under which draw a line and write the divisor beneath. Answer $132\frac{262}{300}$.

Series 277

1. 1164 ÷ 100
2. 2684 ÷ 30
3. [illegible]040 ÷ 60
4. [illegible]251 ÷ 100
5. [illegible]25 ÷ 500
6. [illegible]4275 ÷ 700
7. [illegible]924 ÷ 1100
8. 50642 ÷ 120
9. 82094 ÷ 400
10. [illegible] ÷ 500
11. [illegible] ÷ [illegible]
12. 124[illegible] ÷ 900
13. 620900 ÷ 900
14. 91000 ÷ [illegible]
15. [illegible] ÷ [illegible]

To Divide by 10, 100, 1000, 10000, etc.

Cut off from the right of the dividend as many figures as there are ciphers in the divisor. The remaining figures will express the quotient, and the figures cut off will express the remainder.

Divide 37589 lbs. by 100.

Explanation.—Cut off the two right-hand figures (89) of the dividend, which is equivalent to moving the remaining figures of the dividend two places to the right, thus decreasing the dividend one hundredfold, and producing the required quotient 375 lb.

The figures cut off (89) being the undivided part of the true dividend, must be the true remainder.

Solution.
1 | 00) 375 | 89

375 quo., 89 rem

$374\frac{89}{100}$ Ans.

To Divide when all the figures of the Divisor, except the first on the left, can be changed to ciphers

```
  15)35273
     2     2
 ─────────────
 3 | 0)7054 | 6
 ─────────────
    2351—8 remainder.
```

Explanation.—The divisor, 15, is changed to 30 by multiplying it by 2; the dividend being also multiplied by 2, the quotient is not altered. Cutting off the cipher and dividing by 3, there is one remainder, which, prefixed to the 6 cut off, makes 16. This dividend by 2 is the true remainder.

Therefore 15) 35273 ($2351\frac{8}{15}$

```
       75 ) 42653
        4       4
   ──────────────────
   3 | 00 ) 1706 | 12
   ──────────────────
        568, 53 remainder.
```

Therefore 42653 ÷ 75 = $568\frac{53}{75}$

Series 278

1. 47254 ÷ 15
2. 29685 ÷ 25
3. 78169 ÷ 35
4. 47129 ÷ 55
5. 27967 ÷ 45
6. 279461 ÷ 75
7. 471649 ÷ 125
8. 479647 ÷ 225
9. 714628 ÷ 150
10. 217964 ÷ 250
11. 714789 ÷ 350
12. 721485 ÷ 550
13. 178479 ÷ 450
14. 291786 ÷ 2500
15. 719684 ÷ 3500

To Divide by Aliquots

To divide any number by

$1\frac{1}{4}$	multiply by	8	and divide by	10
$1\frac{2}{3}$	"	6	" " "	10
$2\frac{1}{2}$	"	4	" " "	10
$3\frac{1}{3}$	"	3	" " "	10
$6\frac{1}{4}$	"	16	"	100
$8\frac{1}{3}$	"	12	"	100
$9\frac{1}{11}$		11	"	100
$12\frac{1}{2}$		8	"	100
$11\frac{1}{9}$		9	" "	100
$16\frac{2}{3}$	"	6	" "	100
$14\frac{2}{7}$		7	" "	100
25		4		100
$33\frac{1}{3}$		3	"	100
50		2	"	100
$37\frac{1}{2}$		8		300
$62\frac{1}{2}$		16		1000
125		8	"	1000
$137\frac{1}{2}$	"	8		1100

166⅔ multiply by 6 and divide by 1000
175 " " 4 " " " 700
187½ " " 8 " " " 1500
250 " " 4 " " " 1000
6⅔ divide by 10 and add ½ the result.
7½ " " 10 " " ⅓ "
8⅓ " " 10 " " ⅕ "
13⅓ " " 10 " deduct ¼ "
66⅔ " " 100 " add ½ "
75 " " 100 " " ⅓ "
87½ " " 100 " " ⅐ "
112½ " " 100 " deduct ⅑ "
116⅔ " " 100 " " ⅐ "
125 " " 100 " " ⅕ "
133⅓ " " 100 " " ¼ "
150 " " 100 " " ⅓ "
333⅓ " " 1000 " multiply by 3
666⅔ " " 1000 " add ½ the result.
750 " " 1000 " " ⅓ "

Series 279

Divide

1.	275	4792	6958	7416	each by	1¼
2.	472	6785	2916	2574	"	1⅔
3.	484	2917	4784	2617	"	2½
4.	5174	4986	6127	5784	"	3⅓
5.	297	6471	2849	5174	"	6¼
6	478	5174	2916	2847	"	8⅓
7.	471	29175	6718	4781	"	12½
8.	279	4716	2917	4829	"	16⅔
9.	474	2961	7845	2916	"	14²⁄₇
10.	291	7845	2916	5947	"	25
11.	291	4158	3916	2875	"	33⅓
12.	495	2817	4716	1957	"	62½
13	451	4126	2917	4875	"	125
14.	571	2896	2914	5782	"	166⅔
15.	897	2916	4784	2916	"	250

To the Teacher

Further questions may be given in this work by using the multiplication pages and following the plan used in practicing multiplication by aliquots.

To Divide by the factors of a Divisor

Divide $9128 by 126.

Since the divisor is equal to 3 × 7 × 6, the division of $9128 by 126 may be accomplished by dividing successively by these factors.

Dividing $9128 by 3 (or one forty-second of the true divisor, 126) produces $3042 (or 42 times the true quotient) and a remainder of $2. Since this remainder is left from the true dividend, it must be a part of the true remainder.

Dividing $3042 (one forty-second of the true quotient) by the second factor, 7, produces $434 (which must be one-seventh of 42 (or 6 times the true quotient) and a remainder of $4. Since $4 is left from dividing one-third of the true dividend, this remainder must be one-third of the true remainder ($4 × 3 = $12, second part of true remainder.

Solution.

$126 = 3 \times 7 \times 6$
```
3 ) $9128
    ———————
7 ) 3042 + 2 =                2
    ———
 6 ) 434 + 4 × 3 =           12
    ———————
      $72 + 2 × 3 × 7 =      42
                            ———
                            $56
```

Quotient $\$72\frac{56}{126}$

Dividing $434 (one-sixth of the true quotient) by the remaining factor, 6, produces $72 (the true quotient) and a remainder of $2. Since $2 is the remainder from dividing $434 (one-third of one-seventh of the true dividend) this remainder must be one-third of one-seventh of the true remainder ($2 × 3 × 7 = $42 third part of the true remainder).

Add the several parts of the true remainder obtaining $56 as the total true remainder.

Series 280

1. 25380 ÷ 36	6. 31279 ÷ 72	11. 43716 ÷ 168
2. 178584 ÷ 48	7. 43827 ÷ 84	12. 29373 ÷ 81
3. 23741 ÷ 42	8. 19375 ÷ 125	13. 41658 ÷ 45
4. 43165 ÷ 64	9. 41643 ÷ 135	14. 23725 ÷ 96
5. 41765 ÷ 63	10. 17496 ÷ 147	15. 47916 ÷ 648

Proof of Division

First Method.—Multiply the quotient by the divisor and add in the remainder. If the product gives the dividend, the division is correct.

Second Method.—Cast the 9's out of the dividend, divisor, quotient and remainder. Multiply together the excesses in divisor and quotient and cast the 9's out of the result. To this result add the excess of 9's in the remainder, and cast the 9's out of the sum; if the work is correct, this last excess will be the same as the excess of 9's in the dividend.

Illustration—

283) 876345 (3096		
849	Excess of 9's in 3096 is	0
——	Excess of 9's in 283 is	4
2734		—
2547	4 × 0 = 0, exc. in 0 is	0
——	Excess of 9's in 177 is	6
1875		—
1698	0 + 6 = 6, exc. of 9's is 6 is	6
——	Excess of 9's in 876345 is	6
177	remainder.	

Short Methods in Fractions

Shortening work in fractions, as in all other cases, is largely a matter of making the head save the fingers combined with a resolve to use a scratch pad as seldom as possible. Business fractions are usually of the simplest kind and may very often be handled as easily as whole numbers.

Series 281

By inspection, find the sums of the following problems :

1.	2.	3.	4.	5.	6.	7.	8.	9	10.	11.	12
$\frac{1}{8}$	[illegible]	$\frac{1}{8}$	[illegible]	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{4}$	[illegible]	$\frac{3}{4}$	$\frac{1}{4}$
$\frac{1}{16}$	[illegible]	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{16}$	$\frac{1}{4}$	[illegible]	$\frac{1}{16}$	[illegible]	$\frac{1}{8}$	$\frac{7}{8}$	[illegible]
$\frac{1}{32}$	$\frac{1}{16}$	$\frac{1}{32}$	$\frac{5}{32}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{4}$	[illegible]	$\frac{1}{24}$	[illegible]	$\frac{5}{16}$	[illegible]
$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{3}{4}$	$\frac{1}{16}$	[illegible]	$\frac{3}{8}$	[illegible]	$\frac{1}{16}$	$\frac{1}{4}$	[illegible]

Method.—1st column—Scan the denominators and decide that 32 is the L.C.M. Add as you would whole numbers, changing each fraction to 32nds, mentally, as you go up the column. The reading is as follows : 8, 9, 11, 15, answer is $\frac{15}{32}$.

To Add Rapidly any Pair of Fractions

Question.—Find the sum of $\frac{3}{5}$ and $\frac{4}{7}$.

Method.—Fix the denominator of the sum by multiplying the two denominators together, 5 × 7 = 35.

Multiply the numerator of the first fraction by the denominator of the second and the numerator of the second by the denominator of the first, "cross multiply" as it were. 3 × 7 = 21. 4 × 5 = 20. Add these results. 21 + 20 = 41. The answer is $\frac{41}{35}$ or $1\frac{6}{35}$.

There is nothing in this process that is not done in the usual process of addition. Work it out by your first learned method, and see that it is just a matter of sharpening up our plan of going at the work

Series 282

By inspection, find the sum of :

1. [illegible] + [illegible]
2. [illegible] + [illegible]
3. [illegible] + [illegible]
4. [illegible] + [illegible]
5. [illegible] + [illegible]
6. [illegible] + [illegible]
7. [illegible] + [illegible]
8. [illegible] + [illegible]
9. [illegible] + [illegible]
10. [illegible] + [illegible]
11. [illegible] + [illegible]
12. [illegible] + [illegible]
13. [illegible] + [illegible]
14. [illegible] + [illegible]
15. [illegible] + [illegible]
16. [illegible] + [illegible]
17. [illegible] + [illegible]
18. [illegible] + [illegible]
19. [illegible] + [illegible]
20. [illegible] + [illegible]
21. [illegible] + [illegible]
22. [illegible] + [illegible]
23. [illegible] + [illegible]
24. [illegible] + [illegible]
25. [illegible] + [illegible]
26. [illegible] + [illegible]
27. [illegible] + [illegible]
28. [illegible] + [illegible]
29. [illegible] + [illegible]
30. [illegible] + [illegible]
31. [illegible] + [illegible]
32. [illegible] + [illegible]
33. [illegible] + [illegible]
34. [illegible] + [illegible]
35. [illegible] + [illegible]

In the following problems add the first two fractions, and to the sum add the other fraction.

36. [illegible] + [illegible] + [illegible]
37. [illegible] + [illegible] + [illegible]
38. [illegible] + [illegible] + [illegible]
39. [illegible] + [illegible] + [illegible]
40. [illegible] + [illegible] + [illegible]
41. [illegible] + [illegible] + [illegible]

To subtract rapidly any pair of fractions

Question—From [illegible] take [illegible].

Method—Go through the same process as described in the addition of these fractions In the end subtract the one number from the other, 21 − 20 1, the answer is [illegible].

Series 283

By inspection, find the value of :

1. [illegible] − [illegible]
2. [illegible] − [illegible]
3. [illegible] − [illegible]
4. [illegible] − [illegible]
5. [illegible] − [illegible]
6. [illegible] − [illegible]
7. [illegible] − [illegible]
8. [illegible] − [illegible]
9. [illegible] − [illegible]
10. [illegible] − [illegible]
11. [illegible] − [illegible]
12. [illegible] − [illegible]
13. [illegible] − [illegible]
14. [illegible] − [illegible]
15. [illegible] − [illegible]
16. [illegible] − [illegible]
17. [illegible] − [illegible]
18. [illegible] − [illegible]
19. [illegible] − [illegible]
20. [illegible] − [illegible]
21. [illegible] − [illegible]
22. [illegible] − [illegible]
23. [illegible] − [illegible]
24. [illegible] − [illegible]
25. 27[illegible] − 19[illegible]
26. 121[illegible] − 17[illegible]
27. 124[illegible] − 13[illegible]
28. 64[illegible] − 52[illegible]
29. 83[illegible] − 72[illegible]
30. 89[illegible] − 72[illegible]

To Multiply rapidly two mixed numbers when the integers are alike, and the fractions are ½

Question—What is 8½ times 8½ ?

Solution—

8½
8½
———
72¼

Consider the lower 8½ as a multiplier, and multiply the top 8½ by the first part of it, ½.

1st Step, ½ times ½ = ¼
2nd Step, ½ times 8 = 4
Multiply by 8
3rd Step, 8 times ½ = 4
4th Step, 8 times 8 = 64
———
72¼

Note that the second and third steps give us ½ of 8 + ½ of 8, which is equal to 1 times 8. Then 8 times 8 and 1 times 8 give us 9 times 8 or 72. Add to this the ¼ obtained in the first step, and we have the answer 72¼.

Rule. Multiply the whole number by the next highest whole number, and add ¼ to the product.

Series 284

By inspection, find the value of :

1. 2½ × 2½
2. 3½ × 3½
3. 4½ × 4½
4. 5½ × 5½
5. 6½ × 6½
6. 7½ × 7½
7. 8½ × 8½
8. 9½ × 9½
9. 10½ × 10½
10. 11½ × 11½
11. 12½ × 12½
12. 13½ × 13½
13. 14½ × 14½
14. 15½ × 15½
15. 16½ × 16½
16. 17½ × 17½
17. 18½ × 18½
18. 19½ × 19½
19. 20½ × 20½
20. 24½ × 24½
21. 25½ × 25½

To Multiply together any two mixed numbers when the fractions are ½

Question.—Multiply 12½ by 6½.

Solution—

12½ Consider 6½ as the multiplier, and multiply first by ½.
 6½
1st Step, ½ × ½ = ¼
2nd Step, ½ × 12 = 6
———
81¼

Multiply next by 6.
3rd Step, 6 × ½ = 3
4th Step, 6 × 12 = 72
———
81¼

Question.—Multiply 11½ by 6½.

Solution—

11½
 6½
———
74¾

1st Step, ½ × ½ = ¼
2nd Step, ½ × 11 = 5½ } ½ of (6 + 11)
3rd Step, 6 × ½ = 3 }
4th Step, 6 × 11 = 66
———
74¾

Rule—If the sum of the integers is even, write ¼ in the resulting product. If not write ¾ in the resulting product.

Find one half of the sum of the integers, and to the result add the product of the integers.

Series 285

By inspection find the value of:

1. 9½ × 6½
2. 4½ × 8½
3. 7½ × 12½
4. 16½ × 10½
5. 24½ × 8½
6. 32½ × 2½
7. 12½ × 5½
8. 16½ × 5½
9. 35½ × 3½
10. 120½ × 4½
11. 110½ × 8½
12. 205½ × 7½
13. 90½ × 3½
14. 75½ × 4½
15. 144½ × 10½

Mixed numbers ending in ¼, ⅛, etc., may be multiplied together in practically the same manner as shown in the foregoing explanation.

To Multiply together any mixed numbers

Question—Multiply 18¾ by 16⅔.

Solution—

1. 18 × 16 = 288
2. ⅔ of 18 = 12
3. ¾ of 16 = 12
4. ⅔ × ¾ = ½
5. 288 + 12 + 12 + ½ = 312½.—Ans.

Rule—Multiply the whole numbers together. Multiply the upper whole number by lower fraction. Multiply the lower number by the upper fraction. Multiply the fractions together. Add these four products together.

Series 286

Multiply—

1. 72¾ × 24⅝
2. 16⅝ × 25⅜
3. 36⅔ × 18⅝
4. 63¾ × 32⅘
5. 615⅘ × 41⅜
6. 473⅝ × 19¾
7. 571¾ × 15⅔
8. 739⅘ × 85⅝
9. 2718⅝ × $35\frac{6}{11}$
10. $492\frac{5}{13}$ × 281⅜
11. $75\frac{5}{16}$ × $64\frac{7}{15}$
12. 1825⅜ × 25⅝

To Multiply when the multiplier lacks a fractional unit of being an integer

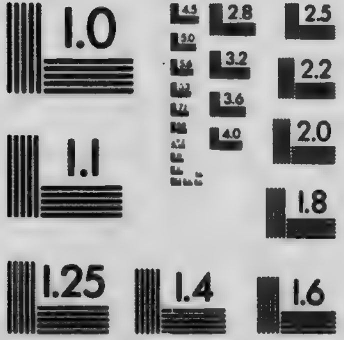
Question—Multiply 96 × 3⅞.

Solution—96 × 4 = 384
96 × ⅛ = 12
———
372

Multiplying by 4 gives a result greater than it should be by ⅛ of the amount to be multiplied. Find ⅛ of the amount, and subtract it from 4 times the amount, and we have 3⅞ times the amount.

MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



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Series 287

Find the value of

1. 72 × $4\frac{3}{4}$
2. 84 × $7\frac{2}{3}$
3. 96 × $7\frac{5}{6}$
4. 125 × $3\frac{4}{5}$
5. 279 × $4\frac{8}{9}$
6. 490 × $8\frac{6}{7}$
7. 190 × $7\frac{9}{10}$
8. 720 × $2\frac{11}{12}$
9. 660 × $6\frac{9}{11}$
10. 288 × $5\frac{7}{8}$
11. 723 × $9\frac{2}{3}$
12. 342 × $9\frac{5}{6}$

Short Methods in Decimals

Approximations—

Suppose that the exact result of an operation is 27.47186. For ordinary business purposes three places may be sufficient. Reading our result to the nearest figure, and retaining but three places of decimals, it becomes 27.472, which is an approximate value of 27.47186 correct to three places of decimals. Short methods in decimals are therefore attempts at getting approximate values to a certain number of places.

Addition

(*a*)	(*b*)	
72.142756	71.143	Solution (*a*) shows the addition carried out complete.
15.2176	15.218	Solution (*b*) shows the solution correct to three decimal places.
42.71594	42.716	This is done by writing each addend retaining only three places of decimals.
130.076296	130.077	The addition is then performed in the usual way.

Subtraction may be handled in the same way where an approximation is sufficient.

Multiplication

Question—Multiply 171.2478 by 8.4712, retaining only 4 decimal places.

```
(a)        171.2478                              (b)   171.24780
             8.4712                                        21748
         ____________                                ___________
            342|4956                                   136689240
           1712|478                                      6849912
         119873|46                                       1198729
         684991|2                                          17124
       13699824|                                            3424
       _____________                                 ___________
       1450.6743|6336                                 1450.67429
                                                Ans.  1450 6743
```

Solution (a) shows the work carried out in full.

Solution (b) shows the work contracted, so as to give an approximation to four decimals places.

Rule—Reverse the multiplier, placing the unit figure thereof directly under the decimal to which it is intended to extend the work (which should be one place further than an accurate answer is required). Multiply as in ordinary multiplication, ignoring all figures in the multiplicand to the right of the figures we are multiplying by. Arrange the several products so that the figures on the extreme right are directly under each other. Add and point off the number of places to which the work is extended.

Series 288

1. 36.275 × 4.3678 retaining 2 decimal places.
2. 41.3075 × 467.32 " 3 " "
3. 17.0036 .08245 " 4 " "
4. .43261 × .73158 " 3 " "
5. .003647 × .12739 " 4 " "
6. 700 375 × .02736 " 3 " "
7. .374825 × .693047 " 5 " "

Division

Question—Divide 714 2965 by 14.367 giving result to four places of decimals.

14.367)714.2965(

Multiply both divisor and dividend by 1000, thus making the divisor a whole number.
14367.)714296.5(

Note at this point that the number 14367, if divided into the number 7142965, will require three figures in the quotient. One of these figures will be a decimal, as there is only one decimal place in the dividend. If we wish to carry the division to four places we must add three ciphers to the dividend, and proceed as in ordinary long division.

Solution (*a*) Ordinary Method.

```
14367)7142965000(497178
      57468
      ------
      139716   ans. 49.7178
      129303
      ------
       103135
       100569
       ------
        25660
        14367
       ------
        112930
        100569
        ------
         123610
         114936
         ------
           8674
```

Solution (*b*) Contracted Method.

```
143670)7142965000(497178
       574680
       ------
       139616—Ans. 49.7178
       129303
       ------
        10313
        10056
        -----
          257
          144
          ---
          113
          100
          ---
           13
           11
           --
            2
```

Rule.—Inspect the divisor and dividend to determine the number of places required in the quotient. For the first contracted divisor take as many significant figures from the left of the given divisor as there are places required in the quotient, and at each subsequent division, reject one plce from the right of the last preceding divisor.

In multiplying bay the several quotient figures carry from the rejected figures of the divisor the figure that would have been included had the work been carried out in full.

Note—Before commencing the work supply ciphers at the right of either divisor or dividend, when necessary.

Series 289

Divide—

1.	27.3782	by	4.3267	correct	to 3	decimal	places.
2.	487.24	by	1.003675	"	2	"	"
3.	8.47326	by	75.45	"	5	"	"
4.	.8487564	by	.075637	"	3	"	"
5.	478.325	by	1.43⅜	"	3	"	"
6.	8972.436	by	756.3452	"	4	"	"
7.	1	by	1.007633	"	6	"	"
8.	.953728	by	44.73654	"	3	"	"

To Reduce British Currency to Canadian Currency

Short Method.

£1 at par is equal to $4.86⅔. Analyze this by taking as a base the old Halifax currency of $4 for £1, 20 cents (⅕ of $1) for 1 shilling, and 1⅔c. ($\frac{1}{12}$ of 20c.) for 1 penny.

£1 at par calculated in this way gives

```
                        $4.00
      + ⅕ of $4, or       .80
  + 1/12 of 80 cts. or    .06⅔
                        -----
                        $4.86⅔
```

To find the value of £15, 3s. 7d. we proceed as follows :

```
    £15, at $4 each   ..  $60.00
    3s., at 20c.  "   ..     .60
    7d., at 1⅔c.  "   ..     .12
                          ------
                          $60.72
  + ⅕ of $60.72 =          12.14
  + 1/12 of 12.14 =         1.01
                          ------
                          $73.87
```

Series 290

Change to Canadian Currency.

	£	s.	d.
1.	72	5	7
2.	47	15	4
3.	57	12	6
4.	195	15	8
5.	240	6	9
6.	475	18	10
7.	547	15	5
8.	297	15	4
9.	547	10	2
10.	679	6	3

Short Methods in Percentage

The principles of aliquot parts may be used to advantage in many operations in percentage, and the percentages of the following table with their equivalent fractions should be thoroughly learned.

PER CENT.	DECIMAL VALUE	FRACTIONAL VALUE	FRACTIONAL VALUE IN LOWEST TERMS	PER CENT.	DECIMAL VALUE	FRACTIONAL VALUE	FRACTIONAL VALUE IN LOWEST TERMS
1%	.01	$\frac{1}{100}$	$\frac{1}{100}$	$22\frac{2}{9}\%$	$.22\frac{2}{9}$	$\frac{22\frac{2}{9}}{100}$	$\frac{2}{9}$
$1\frac{1}{4}\%$	$.01\frac{1}{4}$	$\frac{1\frac{1}{4}}{100}$	$\frac{1}{80}$	$28\frac{4}{7}\%$	$.28\frac{4}{7}$	$\frac{28\frac{4}{7}}{100}$	$\frac{2}{7}$
$1\frac{1}{3}\%$	$.01\frac{1}{3}$	$\frac{1\frac{1}{3}}{100}$	$\frac{1}{75}$	$31\frac{1}{4}\%$	$.31\frac{1}{4}$	$\frac{31\frac{1}{4}}{100}$	$\frac{5}{16}$
$2\frac{1}{2}\%$	$.02\frac{1}{2}$	$\frac{2\frac{1}{2}}{100}$	$\frac{1}{40}$	$33\frac{1}{3}\%$	$.33\frac{1}{3}$	$\frac{33\frac{1}{3}}{100}$	$\frac{1}{3}$
$3\frac{1}{3}\%$	$.03\frac{1}{3}$	$\frac{3\frac{1}{3}}{100}$	$\frac{1}{30}$	$37\frac{1}{2}\%$	$.37\frac{1}{2}$	$\frac{37\frac{1}{2}}{100}$	$\frac{3}{8}$
$6\frac{1}{4}\%$	$.06\frac{1}{4}$	$\frac{6\frac{1}{4}}{100}$	$\frac{1}{16}$	$42\frac{6}{7}\%$	$.42\frac{6}{7}$	$\frac{42\frac{6}{7}}{100}$	$\frac{3}{7}$
$6\frac{2}{3}\%$	$.06\frac{2}{3}$	$\frac{6\frac{2}{3}}{100}$	$\frac{1}{15}$	$43\frac{3}{4}\%$	$.43\frac{3}{4}$	$\frac{43\frac{3}{4}}{100}$	$\frac{7}{16}$
$8\frac{1}{3}\%$	$.08\frac{1}{3}$	$\frac{8\frac{1}{3}}{100}$	$\frac{1}{12}$	50%	.50	$\frac{50}{100}$	$\frac{1}{2}$
$9\frac{1}{11}\%$	$.09\frac{1}{11}$	$\frac{9\frac{1}{11}}{100}$	$\frac{1}{11}$	$56\frac{1}{4}\%$	$.56\frac{1}{4}$	$\frac{56\frac{1}{4}}{100}$	$\frac{9}{16}$
10%	.10	$\frac{10}{100}$	$\frac{1}{10}$	$62\frac{1}{2}\%$	$.62\frac{1}{2}$	$\frac{62\frac{1}{2}}{100}$	$\frac{5}{8}$
$11\frac{1}{9}\%$	$.11\frac{1}{9}$	$\frac{11\frac{1}{9}}{100}$	$\frac{1}{9}$	$66\frac{2}{3}\%$	$.66\frac{2}{3}$	$\frac{66\frac{2}{3}}{100}$	$\frac{2}{3}$
$12\frac{1}{2}\%$	$.12\frac{1}{2}$	$\frac{12\frac{1}{2}}{100}$	$\frac{1}{8}$	$68\frac{3}{4}\%$	$.68\frac{3}{4}$	$\frac{68\frac{3}{4}}{100}$	$\frac{11}{16}$
$14\frac{2}{7}\%$	$.14\frac{2}{7}$	$\frac{14\frac{2}{7}}{100}$	$\frac{1}{7}$	75%	.75	$\frac{75}{100}$	$\frac{3}{4}$
$16\frac{2}{3}\%$	$.16\frac{2}{3}$	$\frac{16\frac{2}{3}}{100}$	$\frac{1}{6}$	$81\frac{1}{4}\%$	$.81\frac{1}{4}$	$\frac{81\frac{1}{4}}{100}$	$\frac{13}{16}$
$18\frac{3}{4}\%$	$18\frac{3}{4}$	$\frac{18\frac{3}{4}}{100}$	$\frac{3}{16}$	$83\frac{1}{3}\%$	$.83\frac{1}{3}$	$\frac{83\frac{1}{3}}{100}$	[illegible]
20%	.20	$\frac{20}{100}$	$\frac{1}{5}$	$87\frac{1}{2}\%$	$.87\frac{1}{2}$	$\frac{87\frac{1}{2}}{100}$	$\frac{7}{8}$
25%	.25	$\frac{25}{100}$	$\frac{1}{4}$	$93\frac{3}{4}\%$	$.93\frac{3}{4}$	$\frac{93\frac{3}{4}}{100}$	$\frac{15}{16}$

Series 291

Find—

		$	$	$
1.	20% profit on	5,	25,	45
2.	25% loss on	4,	36,	76
3.	4% commission on	25,	75,	125
4.	12½% interest on	64,	96,	160
5.	16⅔% duty on	6,	36,	72
6.	8⅓% discount on	12,	72,	60
7.	37½% premium on	80,	32,	48
8.	66⅔% advance on	9,	27,	75
9.	6¼% brokerage on	32,	64,	256
10.	31¼% assessment on	48,	80,	144
11.	87½% dividend on	16,	72,	108
12.	$22\frac{2}{9}$% tax on	27,	45,	63
13.	$28\frac{4}{7}$% rebate on	21,	35,	56
14.	$7\frac{9}{13}$% allowance on	26,	39,	73
15.	75% of the value of	24,	32,	28
16.	90% " "	70,	110,	40
17.	31¼% " "	86,	475,	373
18.	43¾% " "	374,	228,	937
19.	50% " "	½	¼	⅜
20.	125% " "	7.50	375	

In addition to the methods suggested by the table such as dividing by 4 to get 25%, dividing by 3 to get 33⅓%, and so on, a number of percentages can be rapidly calculated from the 10% base. In billing, the student should cultivate the habit of writing the percentage on the paper direct, without carrying the work to a scratch pad, and back to the bill.

Illustrations—

10% of $747.25 = $74.73.

Move the decimal point one place to the left, getting $74.725. If the mills are 5 or over, add one cent, if less than 5 mills, drop them altogether. Thus, to the nearest cent, the answer is $74.73.

20% of $747.25 = $149.45.

See first what 10% would be $74.725. Taking twice this figure to the nearest cent we have $149.45.

30% of $747.25 = $224.18.

Again, 10% = $74.725, 30% is three times the amount or $224.18. In this way 40%, 50%, 60%, 70%, 80%, or 90% of any number may be immediately written.

2½% of $747.25 = $18.68.

As before, 10% = $74.725, 2½ is ¼ of 10%, ¼ of $74.725 = $18.68.

In other words, see 10% first and divide by 4.

Note—In placing the last figure see if the division if carried out another place would give 5 mills or over. If so, follow the rule by adding an extra cent.

3⅓% of $747.25 = $24.91.

See 10% first and divide by 3.

What is 36% of $2500?

¼ of $3600 = $900. Solution—Since 36 times 25 will give the same product as 25 times 36, 36% of $2500 will give the same result as 25% of $3600. 25% is ¼ of a number; therefore, ¼ of $3600, or $900, is the required result.

What is 16% of $12.500?

⅛ of 16,000 = $2000. Solution—16 times 12½ will give the same product as 12½ times 16; hence, 16% of $12.500 is equivalent to 12½% of $16.000. 12½% is ⅛ of a number; ⅛ of $16,000 is $2000, or the required result.

What is 24% of $37,500?

24,000 × ⅜ = $9000. Solution—24 times 37½ will give the same product as 37½ times 24; hence, 24% of $37,500 is equivalent to 37½% of $24.000. 37½% is ⅜ of a number; ⅜ of $24,000 is $9.000, or the required result.

Series 292

1. What is 24% of $560 ?

Solution—

100% of it equals $560.00.
1% of it equals 5.60.
24% of it equals 24 times 1%
$5.60 × 24 equals $134.40.

or

.24 × $5.60 = $134.40.

2. What is 35% of 177 pounds ?

3. What is 42% of 864 ? 962 ?

4. A jobber having 2160 bags of coffee, sold at one time $8\frac{1}{3}$%, at another 25% of what remained, and at a third, sold $33\frac{1}{3}$% of what still remained. Find the value of what was still left at $18 per bag.

5. A farmer having 156 sheep to shear, agreed to pay for their shearing 4% of the sum received for their sale. If the fleeces average $7\frac{1}{2}$ lb. each, and are sold at 30c. per pound, how much was paid for the shearing ?

6. A dealer having bought 240 doz. eggs at 25c. per dozen, sold $8\frac{1}{3}$% of them at cost and the remainder at 27c. per dozen. What was his profit ?

7. A farmer having raised 1240 bu. wheat, used 5% of it for seed and 5% of it for bread. He then sold to one man $33\frac{1}{3}$% of the remainder at $1 per bushel, and to another 25% of what still remained at $1.10 per bushel. How much was received from both sales, and how many bushels were left unsold ?

8. A man owning an estate of $200,000 bequeathed 10% of it to a college, 10% of the remainder to a church, and divided what still remained equally among his four children. What did each child receive ?

Example—Goods are invoiced at $640, with discounts of 25, 10, and 5% off. Find cost of goods ?

Solution—

$640
160 = 25% of $640
$480
48 = 10% of $480
$432
21.60 = 5% of $432
$410.40 = Net price.

The order in which the discounts of any series are considered is not material, a series of 25%, 15%, and 10% being the same as one of 15%, 10%, and 25%, or 10%, 25%, and 15%.

Example—What single discount is equivalent to 25%, 20% and 5% off ?

Solution—

1.00
.25 = 25% of 1.00
.75 = Net after first discount.
.15 = 20% of .75
.60 = Net after 2d discount.
.03 = 5% of .60.
.57 = Net after 3d discount.
1.00 − .57 = .43, or 43%, the single discount.

OR

1.00		1.00		1.00	
.25		.20		.05	
.75	×	.80	×	.95 =	.57
1.00	−	.57	=	.43	

Find the net amount of the following bills :

9. $1550 less $33\frac{1}{3}$% and 20%.
10. $840 less 25% and 10%.
11. $3500 less 20% and $14\frac{2}{7}$%.
12. $395 less 20% and 20%.

13. A wholesale dealer offers cloth at $2.40 per yard subject to a discount of 25%, 20% and 5%. How many yards can be bought for $492.48 ?

14. Find the net price of two tons of fence wire listed at 3c. per pound and sold 20% and 25% off.

15. One drummer offers to sell me $1500 worth of iron pipe at a discount of 25%, 10%, and 10%; another offers to sell me a similar quantity of pipe for the same amount less 20%, 20%, and 5%. Which is the better offer, and what is the difference expressed in dollars?

16. Having bought $1500 worth of merchandise at 20% and 25% off, I sold it for $1500 less 15%, 10%, and 20%, off. Did I gain or lose, and how much?

What single discount is equivalent to the following discount series?

17. 10% and 10%
18. 20% and 10%
19. 10% and 5%
20. 25% and 20%
21. 33⅓% and 10%
22. 20%, 25% and 10%
23. 25%, 33⅓% and 10%
24. 20%, 20% and 10%
25. 50%, 20% and 5%
26. 30%, 20% and 10%

Short Method

To find, mentally, a single discount equivalent to a series of two discounts.

Rule. From the sum of the discounts subtract $\frac{1}{100}$ of their product

When a third discount is given, combine it with the result obtained from the other two.

Note—While this method is useful in making comparisons, it cannot be used in invoicing. If two or more discounts are allowed on a bill they must be taken off one after another as first illustrated.

By inspection find a single rate of discount equivalent to the following discount series:

27. 20% and 10%
28. 10% and 10%
29. 25% and 10%
30. 30% and 10%
31. 20% and 5%
32. 20% and 12½%
33. 20% and 20%
34. 25% and 25%
35. 5% and 5%
36. 60% and 25%
37. 10% and 12½%
38. 10% and 6%
39. 15% and 6%
40. 25% and 8%
41. 33⅓% and 6%

The Six Per Cent. Method for Interest

This method is formed on a basis of 360 days to the year. The following facts will be self-evident:

At 6% per annum the interest of $1.

Fact 1.—For 1 year, or 360 days, is 6c. = .06 of the principal.
" 2.—For $\frac{1}{6}$ year, or 60 days, is 1c. = .01 of the principal ($\frac{1}{6}$ of .06).
" 3.—For $\frac{1}{12}$ year, or 30 days, is 5m. = .005 of the principal ($\frac{1}{2}$ of .01).
" 4.—For 6 days, is 1m. = .001 of the principal ($\frac{1}{5}$ of .005).
" 5.—For 1 day, is $\frac{1}{6}$ m. = .000$\frac{1}{6}$ of the principal ($\frac{1}{6}$ of .001).

From these facts we deduce following general rules:

1. The interest for 1 day at 6% is found by removing the decimal point 3 places to left in the principal and dividing the result by 6. (See Fact 5.)

2. The interest for 6 days at 6% is found by removing the decimal point 3 places to left in principal. (See Fact 4.)

3. The interest for 30 days at 6% is found by removing the decimal point two places to the left in the principal and dividing the result by 2. (See Fact 3.)

4. The interest for 60 days at 6% is found by removing the decimal point two places to the left in the principal. (See Fact 2.)

Since interest in Canada is reckoned upon a basis of 365 days to the year, the interest found by the "Six Per Cent. Method," which is based upon the supposition that 360 days make a year, is not strictly accurate.

Since the year contains 365 days, the interest, found by the Six Per Cent. Method for 360 days to the year, is $\frac{5}{365}$ or $\frac{1}{73}$ part of itself too large.

If the Six Per Cent. Method is used the result must be decreased by $\frac{1}{73}$ to get the accurate interest.

Example—

1. What is the interest on $350 for 60 days at 6% ?

Solution—
$350 pointed off as hundredths = $3.50.

Explanation—6% interest on any sum for 60 days is 1%, or 1 hundredth of it. (Rule 4.) 1% of any number is obtained by pointing off two decimal places from the right of the number.

$3.50 - 1/73 of $3.50 = $3.45 Answer.

2. What is the interest on $1500 for 93 days at 6% ?

Solution—
$15|00 = Interest for 60 days.
7|50 = Interest for 30 days.
|75 = Interest for 3 days.
$23|25 = Interest for 93 days.

Explanation—Interest for 30 days is ½ that for 60 and for 3 days is 1/10 that for 30 days. By uniting the partial interest products the entire interest is obtained.

$23.25 - 1/73 of $23.25 = $22.93 Answer.

3. What is the interest on $450.75 for 1 year 111 days at 6% ?

Solution—

1 year 111 days = 476 days.

$4.5075	= Interest for 60 days		
$31|5525	= "	420 "	(60 × 7)
2|25375	= "	30 "	(60 ÷ 2)
1|126875	= "	15 "	(30 ÷ 2)
|75125	= "	10 "	(30 ÷ 3)
|075125	= "	1 "	(10 ÷ 10)
$35|759500	= "	476 days.	

Shorter Process.
$4.508
$31.556
2.254
1.127
.751
.075
$35.763

$35.763 - 1/73 of $35.763 = $35.27 Answer.

Note—1. For business purposes it is sufficiently exact to carry the work to mills, as in the shorter process.

2. In this process when the decimal in the fourth places is less than 5 it is rejected; when 5 or greater than 5, the figure in the third decimal place is increased by one, and the decimals to the right of the third decimal place are rejected.

To find the interest at any other rate than 6% by this method, first find the interest at 6%, and then increase or diminish the result by as many sixths as the given rate is units greater or less than 6%. Thus, for 7% add ⅙, for 8% add 2/6 or ⅓, for 4% subtract 2/6 or ⅓, etc.

4. What is the interest on $250 for 105 days at 7½% ?

Solution—
$2|50 = 60 days.
1|25 = 30 days.
|625 = 15 days.
4|375 = 105 days at 6%
1|094 = 105 days at 1½%
5|469 = 105 days at 7½ %

Explanation—105 days are equal to 60 days plus 30 days plus 15 days. The interest on $250 for 60 days is $2.50, divided by 2 is $1.25, the interest for 30 days, which amount divided by 2 gives $.625, the interest for 15 days. The entire interest at 6% increased by ¼ of itself is the interest at 7½%.

$5.469 - 1/73 of $5.469 = $5.39 Answer.

Series 293

By Six Per Cent Method Find the Interest on:

1. $360 for 92 days at 6%
2. $520 for 36 days at 6½%
3. $720 for 25 days at 5½%
4. $960 for 116 days at 4%
5. $480 for 314 days at 3%
6. $125 for 124 days at 7%
7. $3200 for 120 days at 6%
8. $1260 for 142 days at 7%
9. $3120 for 314 days at 4%
10. $1460 for 215 days at 4½%
11. $1200 for 123 days at 6%
12. $960 for 146 days at 5%
13. $320 for 95 days at 7%
14. $480 for 292 days at 8%
15. $560 for 165 days at 9%
16. $940 for 73 days at 4½%
17. $120 for 90 days at 6%
18. $340 for 83 days at 7%
19. $160 for 75 days at 8%
20. $320 for 62 days at 9%

By Six Per Cent. Method Find the Interest on:

21. $145 for 37 days at 4%
22. $500 for 16 days at 6%
23. $460 for 92 days at 5%
24. $1236 for 36 days at 4%
25. $3840 for 84 days at 9%
26. $1450 for 39 days at 6%
27. $365 for 219 days at 5%
28. $496.50 for 180 days at 3%
29. $324.60 for 30 days at 4%
30. $189.70 for 85 days at 6%
31. $320 for 120 days at 6½%
32. $490.20 for 40 days at 6¾%

	PRINCIPAL	FROM	TO	RATE
33.	$35.61,	Nov. 11, 1901,	Dec. 15, 1903,	6%
34.	$50.00,	Sept. 4, 1900,	Jan. 1, 1902,	3½%
35.	$97.86,	May 17, 1900,	Dec. 20, 1906,	7%
36.	$325.28,	June 20, 1902,	Sept. 4, 1904,	8%
37.	$154.75,	April 10, 1905,	Nov. 24, 1905,	6%
38.	$861.50,	June 3, 1905,	March 25, 1906,	5%

Series 294

Practice in Billing

J. M. FRASER,
Stratford, Ont.,

Toronto, Dec. 1, 1901.

Bought of
JOHN McDONALD & CO.

[illegible] days, 30 days 5%.

Case			Yds.	Price	Items	Amount
No. 19.	12	pcs. Muslin				
		37^1 32^3 33 35^3 35^2 37 38^1 36 32 35 34 36		6¾c.		
31.	15	pcs. Bleached Cotton				
		44^2 45^3 47^1 44 47 45^2 43^1				
		42^2 45^3 42 41 45^2 43^3 41 42		7c.		
7.	6	pcs. E. Lining				
		40^1 52^2 50^2 54 55^1 54		3⅛c.		

Note—The small figures represent quarter yards.

(2) JOHN WHITE & Co., Woodstock, Ont., bought of Wyld, Darling Co., Limited, Toronto. Terms: 60 days, 30 days, 5%.

7 pcs. W. Print, 45^3 50^3 55 46^2 51 45 51 at 5½c.
12 pcs. M Shirting, 41, 43, 50, 43, 52, 42, 41, 40, 46, 40, 50, 43 at 5¼c.
5 gross T. Braid at $7.87½.

5 pcs. Sateen, 60^3, 55^3, 50, 50^1, 60^2 at 4¾c.
6 pcs. V. Bare[illegible], 20, 25, 23, 22, 25, 20 at 4¾c.
10 doz. M. L. Thread at 60c.

10 pcs. R. Prints, 40, 51, 56, 42^1, 52, 56^3, 55^2, 41, 52^3, 56 at 4¾c.
3 doz. W. G. R. Shirts at $7.25.

6 pcs. C. Jeans, 50^3, 45^1, 51^2, 46, 50, 55 at 5c.
10 cases E. Batts at $5.95.

536 to 542 Dundas St.,
Toronto, Aug. 22, 1905.

3. Sold to Messrs. H. Martin & Son,
Cluney Ave.

By A. MILES.

		15 pcs. 12 × 12 – 14 G. P.	30.00			
		5 " 12 × 14 – 18 "	32.00			
		2 " 8 × 14 – 20 "	32.00			
		5 " 10 × 10 – 14 "	29.00			
		2 " 12 × 16 – 18 "	34.00			
		1 " 12 × 16 – 20 "	34.00			
		7 " 10 × 18 – 18 "	36.00			
		5 " 10 × 18 – 20 "	36.00			
		4 " 10 × 18 – 16 "	36.00			
		2 " 10 × 18 – 12 "	36.00			
		1 " 10 × 18 – 24 "	36.09			

Note—" Price " generally means price per M feet, board measure. Number of board feet is found by multiplying the length in feet by the width and thickness in inches and dividing by 12.

536 to 542 Dundas St.,
Toronto, Dec. 22, 1905.

4. Sold to Messrs. BROOKS & PALMER,
29 Emerson Ave.,

By A. MILES.

		560 feet Pulley Style	1.75			
		380 " Hanging Style	1.31			
		500 " ⅞ × 3¼ Lining	1.10			
		500 " ⅞ × 3¾ ,,	1.20			
		60 " 2 × 6 Sash Sill	3.50			
		260 " Parting Stop	.60			
		70 " 1¾ Window Stop	.75			
		62 " 2 × 6 Door Jam	3.50			
		6 " 2 × 6 Oak Sill	7.00			

Note—All items in above are sold by the hundred.

5. Mr. John Jones,
950 St. Thomas St.,
Toronto.

Toronto, May, 13, 1905.

Bought of LEVER BROTHERS, Limited,
Soap Manufacturers.

Terms : Net Cash, 30 days.

Case			Price			
15		Sunlight Doublets @ $	4.10			
10		" Octagons	4.00			
5		Lifebuoy Royal Disinfectant Soap	4.00			
2		Cheerful	3.60			
7		Crest White Floating Soap	4.00			
3		Monkey Brand Polishing Soap	4.00			
2		Lever's Dry Soap Powder	4.00			
1		Y (wise head) Z Disinfectant Soap Powder	4.00			
[illegible]		Silk Skin Toilet Soap	10.50			
3		Coral Toilet Soap	5.25			

A 5-01-~3/472. **The Commercial Text Book Co.**
Wholesale Stationers, Printers, Bookbinders and
6. Manufacturers of Account Books.
Toronto, June 17, 1905.

Sold to MR. JAMES SMITH,
Woodstock, Ont.
Terms :—5/30.

Description	No.	Ch'ck	Quantity		Price	Amount	Total
Pcl. Sets	1971		1	Doz.	.80		
"	1976		1	"	1.25		
Sanford Stamp Pad Ink			1	"	.80		
Stylo's	35		½	"	1.50		
Victoria Carbon	Blue		134	x	1.35		
" "	Black		2	c.	1.35		
" "	Purple		1	"	1.35		
Holders	2305		3	Doz.	.40		
Pencils	264		1	Box	2.40		
" Cleopatra			1	"	2.40		
"	113		2	Doz.	.40		
Files, 8vo. Paper Boards			½	"	2.00		
Files, 4to "			½	"	2.40		
Microscope	0253		1	"	.80		
"	0221		1	"	1.25		
"	905		½	"	2.50		
Crayon	1035		1	"	.75		
Order Book	10		1	"	1.25		
" "	11		½	"	1.25		
" "	12		½	"	2.25		
Tuck's Cards, assorted			1c.	Env.	.10		

Per G. T. R.

7.

INVENTORY

3 10/12	dozen 4" Flat Brushes	@	$10.50	dozen.
2	" Pencils	@	6.75	gross.
2	gross Striping Pencils	@	4.25	"
5.	packages Glazier's Points	@	.12	package.
2915	lbs. Resin, per 280 lbs.	@	5.00.	
300	lbs. Flour, per 196 lbs.	@	4.20.	
700	lbs. Plaster Paris, per 300 lbs.	@	1.75.	
3000	lbs. Soap Stone Talc Facing	@	17.45	ton.
3	only, Brooms, Sweeping	@	2.85	dozen.
11	" Moulders' Brushes, hard	@	3.05	"
58	" 20 lb. Crucibles	@	.09¼	lb.
893	lbs. No. 30 Emery	@	5.40	cwt.
9/10	rm. No. 0 Emery cloth	@	10.80	rm.
65	only, 22 Hammer Handles	@	2.20	dozen.
53	" 36 " "	@	3.80	"
	Less 42½%			
5	" Pick Handles	@	5.25	"
8 16/20	rms. No. 2 Sand Paper	@	3.33	"
51	lbs. Crushed Quartz	@	.03¼	lbs.
230	" Sal. Soda	@	.01¾	lb.
38	" Twine for Parcelling	@	.16¼	lb.
5/12	doz. 1 15/64" Twist Drills	@	3.75	each.
3/12	" 1 11/16" " "	@	9.10	"
	Less 75 and 10%			
50	only ½ × 6 Coach Screws	per 100	8.33	
40	" ½ × 7 " "	"	8.83	
	Less 70, 5-10 and 12½%			

8. The T. Eaton Co., Limited, Toronto, March 1, 1906.

Bought of

THE FURNITURE MANUFACTURERS ASSOCIATION.

Terms : Cash 5%, 10 days 2%.

2	doz. Kitchen Tables (each) .... Less 10%	$ 4.20	100 10	30 08	90	72
4	doz. Common Lounges (each) .... Less 15%	9.00	XXX XX	XX	XXX	XX
15	10 ft. Walnut Extension Tables .... Less 12½%	16.00	XXX XX		XXX	
6	doz. Dining Room Chairs (per doz.)......	11.25	XX	XX		
¾	doz. Cottage Bedsteads (each)	4.75	XX	XX		
7	Walnut Marble Top Centre Tables	12.50	XX	XX		
	Less 20%		XXX XX	XX XX	XXX	XX
3	doz. Antique Oak Bedroom Sets (each) .. Less 15%	25.00	XXX XXX		XXX	
1	doz. Cherry Bedroom Sets (each) ..... Less 25%	32.00	XXX XX		XXX	
½	doz. Birds-eye Maple Bedroom Sets (each) Less 33⅓%	75.00	XXX XXX		XXX	
7	Office Desks, Oak (each) .... Less 2 10's	24.00	XXX XX	XX	XXX	XX
¾	doz. Rockers, Upholstered (per doz.) ..... Less 20%	33.00	XX X	XX	XX	XX
3	doz. Fancy Baby Cabs (each) .... Less 25%	11.50	XXX XXX	XX	XXX	XX
					XXXX	XX

What is the net of the bill? How much would settle the bill on date of sale? How much would settle the bill March 11, 1906?

9. Find the amount of the following pay roll on the basis of a 10 hour day.

No.	Names.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Rate.		Amount.	
1	[illegible]. Tanton	9	8	9	9	9	8	5	50		
2	[illegible] Gamble	9	7	8	9	5	8	5	10		
3	W. McAlpine	8	9	8	8	7	8	4	20		
4	F. Eaton	7	7	8	8	9	7	6	00		
5	D. Tolchard	8	7	7	9	9	8	3	50		
6	T. Watson	8	8	8	8	6	7	2	75		
7	F. McIntosh	11	8	10	9	8	8	3	25		
8	N. Arnold	9	9	9	7	8	8	4	10		
9	D. Fraser	5	6	8	6	8	7	4	00		
10	W. Lambe	8	8	8	8	7	8	3	25		
11	F. Gain	10	7	8	8	8	5	2	75		
12	F. Ferrier	9	7	[illegible]	7	7	9	1	75		
13	G. Gallow	9	8	[illegible]	8	9	11	4	00		
14	N. Martin	9	9	9	8	7	7	4	50		
15	R. Carlyle	8	9	9	8	8	5	4	50		
16	K. Moffat	9	11	10	8	9	9	3	50		

10. Find the amount of the above on the basis of an 8 hour day.

11. **Rice Lewis & Co.,** Toronto, May 1, 1906.

Sold to D. MYERS & CO.,

Terms: 90 days net Stratford.

Or. No.	Quan.	Size.	Description.	Price.	Gross.		Net.	
11146	348-9*	1 inch	Pipe 47½, 4-10's, 5%	.11¼	40	98	13	40
	109-4	5 inch	Pipe 57½, 3-10's, 7½%	1.42				
	16	1 inch	Globe Valves 67½, 10, 5%	2.90				
	60	1 × 8	Nipples 85, 7½%	.47				
	75	2 inch	Couplings 65, 5%	.60				
	25	1 × 6	Flanges 80, 10%	.95				
	125	1½	Ells 75, [illegible]%	.35				
	55	2½ × 2 × 1	Tees 65, 10, 5%	1.75				
	6		Fin. Water Gauges 55, 10, 2½%	12.00				
	10	2¼	Oil Cups 40 5, 2½%	3.25				
	6	3 inch	Lubricators [illegible], 15%	6.50				
	6	2¾	Flue Cleaners 57, 15, 5%	4.25				

What is the net of the bill?

*348-9 = 348 feet 9 inches; the discounts on this item are 47½%, 10%, 10%, 10%, 10%, and 5%.

12. Find the amount of the following pay roll, on the basis of an 8-hour day:

No.	Names.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Rate.		Amount.	
1	W. Ellsworth	9	9	9	9	9	5	2	50		
2	C. Nichols	9	10	8	7	9	8	3	50		
3	M. Varty	8	7	7	8	9	8	3	00		
4	M. Porter	8	8	8	7	8	9	3	00		
5	J. Armstrong	9	7	9	8	8	8	1	75		
6	A. Kelk	8	8	8	8	9	11	2	50		
7	W. Lucas	7	8	8	8	9	5	3	00		
8	A. Coxall	7	8	10	9	8	12	3	50		
9	W. Downey	10	9	9	9	9	9	3	00		
10	F. Burton	9	8	9	10	9	8	2	00		

13. Find the amount of the above on the basis of a 10-hour day.

14.
ENGINEERS
MAIN LINE

COMPLETE THE FOLLOWING PAY ROLL.
CANADA SOUTHERN RAILWAY

No......

Sums Due for all Personal Services During the Month of November, 1905, Canada Southern Division.

No.	NAME	OCCUPATION	No. Days	Rate Per Day		Amount		Total		R. R. Hospital		Amt. to be paid	
				$	c.	$	c.	$	c.	$	c.	$	c.
			21.4	3	28	70	20					114	30
1.	Smith, Robert	Engineer	14.3	3	12	44	60	114	80		50		
2.	White, Thomas R.	"	27.6	2	50						50		
3.	Jones, John J.	"	41.2	3	24								
			3.	3	60						50		
			.5	3	60								
4.	Sanders, Frederick L.	"	16.1	3	24						50		
			14.	3	75								
			3.3	3	50								
5.	Hayslip, William H	"	2.5	3	12						50		
			2.8	3	60								
6.	Crawford, Clare A. V. H.	"	43.5	3	24								
			24.1	3	28								
			14.5	3	12								
7.	Truman, Lee H.	"	.2	3	50						50		
			2.1	3	60								
8.	Bourne, J. J.	"	41.3	3	14						50		
			2.9	3	60								
9.	O'Donnell, E. G.	"	43.8	3	24						50		
			.5	3	60								
10.	Stacy, Arthur R.	"	16.1	3	24						50		
			2.8	3	60								
11.	Smith, Frederick E.	"	36.8	3	24						50		
12.	Heard, John	"	33.9	3	28						50		
13.	Middleton, Richard W.	"	26.5	3	14						50		
			25.5	3	28								
			6.5	3	12								
14.	Garrow, William	"	.2	3	50						50		
			22.4	3	28								
15.	Howard, Hugh	"	12.1	3	12						50		
			28.2	3	28								
16.	Boyle, Harry J	"	10.3	3	12						50		
17.	Hall, Clarence	"	34.8	2	50						50		
18.	Baldwin, Frank H.	"	30.	2	50						50		
			12.1	3	28								
			13.	3	12								
19.	Carr, George	"	1.2	2	50						50		
			14.	3	75								
20.	Little, William T.	"	2.7	4	00						50		
21.	Garrod, John R.	"	41.9	3	12						50		
			8.6	3	28								
22.	Singer, Charles	"	10.5	3	12						50		

CORRECT	APPROVED	AUDITED
Signed M. J. MCCARTNEY,	(Signed E. D. BRONNER)	Signed A. J. B.
Div. Master Mechanic.	*Superintendent Motor Power and Equipment.*	*Auditor.*

Note :—Each item is worked to the nearest 5c.

Addition Drills with Discounts

Page 8. 10% and 5% off.

	Series 295	Series 296	Series 297	Series 298	Series 299
1.	14 D Lt	3 18 B H	6 18 E Lt	2 21 D Lt	3 30 C Lt
2.	16 K Rt	2 20 C I	5 27 A E	9 30 K Rt	4 30 C G
3.	13 J N	4 16 E Lt	8 24 E J	8 30 A F	5 29 J Rt
4.	14 H L	3 17 J Rt	9 25 C G	7 30 C G	7 30 F K
5.	16 L Rt	4 19 H L	3 26 E H	10 30 B H	5 28 D H
6.	20 C H	5 22 D I	2 30 C Lt	3 26 E I	30 K Rt
7.	16 C G	6 24 A F	9 27 K Rt	2 28 L Rt	30 B F
8.	20 B H	5 22 B H	7 27 G M	3 26 G K	2 28 A F
9.	21 E J	4 24 E J	8 26 E J	4 30 B F	5 30 H Lt
10.	19 B G	16 K Rt	15 K Rt	3 30 D Lt	6 30 I M

Page 9. 10%, 5% and 5% off.

	Series 300	Series 301	Series 302	Series 303	Series 304
1.	8 C Lt	2 22 D Lt	10 28 D Lt	10 28 D Lt	30 C Lt
2.	16 B G	2 22 K Rt	3 23 L Rt	10 28 K Rt	3 30 A D
3.	19 K Rt	2 22 F K	2 21 G K	9 28 B F	5 30 D G
4.	18 I M	3 21 B F	2 24 B F	12 30 A E	3 30 G J
5.	10 C H	3 21 D H	2 30 C Lt	12 30 J Rt	2 30 F Lt
6.	12 E J	4 22 L Rt	4 30 C F	9 29 H L	8 30 H Rt
7.	11 J N	2 24 C G	4 28 A E	5 30 D H	4 30 B E
8.	12 F I	4 24 A E	3 27 D H	6 30 H M	4 30 C E
9.	18 C H	5 25 D Lt	2 27 K Rt	7 27 D I	5 30 F H
10.	22 D G	6 24 D I	4 30 H L	4 30 D G	3 28 I L

Page 10. 33⅓, 10, 10 and 5% off.

	Series 305	Series 306	Series 307	Series 308	Series 309
1.	10 E Lt	2 17 D Lt	8 20 E Lt	2 30 D Lt	30 C Lt
2.	12 B G	2 18 B F	7 22 A F	4 30 B G	30 B E
3.	13 D H	3 19 D H	8 23 C H	10 30 D H	30 F I
4.	12 K Rt	4 20 F K	9 26 E I	9 29 F J	30 J M
5.	15 H M	2 22 I M	10 25 F K	5 30 D G	3 30 D Lt
6.	13 C H	4 24 K Rt	12 28 I M	3 30 F K	5 30 B F
7.	16 D Lt	5 25 H M	13 27 K Rt	7 30 K Rt	2 28 E I
8.	16 L Rt	6 24 E Lt	15 30 I N	5 30 F J	3 30 K Rt
9.	14 B F	4 24 A E	6 26 D I	8 30 L Rt	4 30 I L
10.	15 G K	7 27 B F	7 27 A E	5 28 H K	5 30 H Rt

Page 11. 40%, 5%, and 3% off.

	Series 310	Series 311	Series 312	Series 313	Series 314
1.	10 D Lt	2 12 D Lt	7 17 C Lt	11 21 C Lt	15 30 A E
2.	12 C G	3 13 B F	6 15 A E	12 22 C G	5 30 C Lt
3.	13 G L	4 15 D H	8 18 C G	10 24 B F	6 26 C G
4.	11 E J	2 15 F J	9 20 F J	13 26 D H	10 30 F J
5.	14 K Rt	3 16 H M	6 20 G K	15 30 K Rt	4 28 H K
6.	15 I M	4 17 J N	8 24 I M	14 24 E J	3 30 K N
7.	12 A E	6 15 K Rt	10 20 J Rt	12 28 I L	2 30 B E
8.	14 B F	2 16 A D	9 19 H L	15 30 D Lt	8 28 D H
9.	10 D I	3 17 C G	7 21 J M	17 27 A D	30 C F
10.	15 F J	4 14 F K	8 18 G K	16 30 C G	30 G J

Page 12. 10%, 5% and 2% off.

	Series 315	Series 316	Series 317	Series 318	Series 319
1.	10 D Lt	3 23 A E	6 20 L Rt	3 26 L Rt	3 30 L Rt
2.	12 A E	4 23 B F	5 15 I N	4 24 J N	4 29 I M
3.	10 K Rt	3 26 K Rt	7 22 G K	10 28 G K	4 28 G J
4.	12 G K	5 25 C G	6 26 F I	11 26 D H	3 28 C F
5.	18 B F	4 25 F K	10 30 C G	9 23 C F	2 30 A D
6.	9 D H	2 26 I M	3 23 D Lt	8 28 A E	30 B Lt
7.	13 G J	5 20 K Rt	4 28 A D	7 24 D Lt	30 L Rt
8.	15 I M	3 23 G J	6 26 E H	6 25 D H	3 30 B E
9.	15 F I	4 18 C F	2 22 G K	9 29 F J	2 29 C G
10.	21 J N	2 20 D H	8 24 I L	2 28 C Lt	2 30 F I

Page 13. 40%, 10% and 5% off.

	Series 320	Series 321	Series 322	Series 323	Series 324
1.	15 D Lt	2 24 L Rt	6 26 K Rt	10 30 A E	18 30 A E
2.	18 B F	3 23 J M	7 27 C Lt	2 21 C Lt	17 27 B F
3.	20 K Rt	4 28 I L	8 26 A F	4 22 D H	20 30 K Rt
4.	16 J N	2 26 G K	6 26 C G	3 24 C F	15 30 J M
5.	21 I L	4 26 E H	7 28 D H	4 26 E I	14 29 G J
6.	23 G J	5 30 D G	8 30 F I	5 25 G K	5 25 B Lt
7.	20 F K	3 26 B F	9 30 G K	11 26 J M	6 26 J L
8.	22 D H	2 26 C Lt	4 22 I L	3 27 L Rt	8 30 B E
9.	19 B E	5 25 B E	2 23 J M	9 24 A D	30 E G
10.	23 D G	4 28 A D	8 24 K N	10 25 B E	30 I K

Multiplication Drills with Discounts

Page 55. Multiply by 3, 10 and 10% off.

	Series 325	Series 326	Series 327	Series 328	Series 329
1.	5 C Lt	2 6 L Rt	4 9 C Lt	8 13 F I	18 23 C Lt
2.	6 A D	3 8 K N	5 10 A D	7 12 G K	17 24 A D
3.	4 B E	2 7 J M	4 10 B F	9 15 I L	19 25 B E
4.	6 C F	3 9 I L	5 11 C G	10 16 J M	20 26 C F
5.	5 D G	2 8 H K	6 12 E H	11 17 K N	21 27 D G
6.	7 F H	2 7 G J	4 11 F I	10 18 M Rt	22 28 E I
7.	6 G K	3 8 F I	6 13 G J	12 19 E H	23 29 G J
8.	5 I L	4 10 D H	7 13 H K	13 20 D G	24 29 H K
9.	6 L Rt	3 9 C F	6 12 I L	14 21 C F	21 28 J M
10.	5 K N	2 8 A D	7 13 L Rt	16 22 A D	24 30 L Rt

Page 55. Multiply by 13. 10 and 10% off.

	Series 330	Series 331	Series 332	Series 333	Series 334
1.	4 L Rt	3 7 C Lt	6 10 L Rt	12 16 E H	18 23 C F
2.	5 K N	4 8 B F	7 12 J M	13 19 D G	19 26 A C
3.	6 I L	3 8 D G	8 13 C Lt	17 22 C F	20 25 C Lt
4.	5 H K	4 9 E H	9 14 A D	18 24 B E	21 26 D G
5.	7 G J	4 10 F I	10 15 B E	19 25 A D	22 27 F I
6.	6 F I	3 10 H J	9 16 D F	20 26 B Lt	23 28 G J
7.	4 D H	4 11 I L	11 16 E H	18 24 F I	24 28 H L
8.	5 C F	5 10 J M	12 17 F I	19 25 G J	25 30 J N
9.	4 B E	4 9 K N	10 16 G J	21 26 I K	23 27 K N
10.	5 C Lt	3 8 L Rt	13 18 H K	20 25 J M	24 29 L Rt

Page 56. Multiplv by 4. 30, 5, 5, 3% off.

	Series 335	Series 336	Series 337	Series 338	Series 339
1.	5 L Rt	3 8 C Lt	6 10 D Lt	11 16 C Lt	19 26 C Lt
2.	6 K N	3 8 B F	5 11 C G	12 16 K Rt	21 27 L Rt
3.	5 C Lt	2 6 A E	8 12 K Rt	13 18 B F	23 28 A D
4.	4 A E	4 9 K Rt	9 15 I L	12 18 F I	24 30 C F
5.	6 C F	3 7 H L	10 14 E I	14 20 J M	26 30 E I
6.	7 D G	2 8 E I	11 16 C F	15 20 A E	25 30 J N
7.	5 E H	3 9 B E	12 16 G K	16 22 L Rt	22 28 I L
8.	6 F I	4 8 K Rt	13 17 L L	15 21 H K	20 30 B D
9.	4 J M	3 7 C G	10 16 H K	22 25 A D	24 28 D H
10.	5 I L	4 8 G J	14 18 C G	20 25 C G	22 29 H K

Page 56. Multiply by 14, 33⅓ and 5% off.

	Series 340	Series 341	Series 342	Series 343	Series 344
1.	4 C Lt	2 6 C Lt	6 12 A D	14 18 C Lt	22 26 A D
2.	4 A D	3 7 B E	7 13 C E	15 20 B E	23 28 C E
3.	5 D G	2 7 D H	8 12 D H	14 20 D F	25 30 L Rt
4.	4 L Rt	2 6 G J	9 14 F I	16 21 E H	24 28 D G
5.	6 C F	3 8 I M	10 15 H K	16 22 I K	24 30 F H
6.	5 E H	2 8 L Rt	9 16 J L	20 25 L Rt	26 30 G K
7.	4 F J	4 8 C F	11 16 K N	19 26 J L	23 29 J L
8.	6 I K	5 9 A E	10 16 L Rt	18 24 G I	24 30 K N
9.	5 J M	4 10 E G	13 17 C Lt	22 26 A D	20 30 I K
10.	5 L Rt	5 10 H K	12 16 L Rt	20 26 B Lt	27 30 J Rt

Page 57. Multiply by 5, 25, 5, 5 and 2% off.

	Series 345	Series 346	Series 347	Series 348	Series 349
1.	5 C Lt	3 10 A D	7 16 L Rt	14 26 L Rt	13 25 A D
2.	4 B F	4 11 B F	6 16 K M	15 25 C Lt	17 30 C Lt
3.	5 L Rt	3 12 C G	8 18 H K	16 27 A D	18 30 C E
4.	4 C G	5 15 K Rt	9 16 F H	17 30 C E	19 27 D G
5.	6 E H	4 13 H K	10 20 D G	18 28 D G	19 30 F I
6.	5 F I	3 13 E H	9 19 C F	19 29 E H	18 28 K Rt
7.	6 G J	4 15 C F	11 20 C Lt	20 30 F J	18 30 G J
8.	4 F J	5 15 A D	10 22 B D	20 30 F K	16 29 I L
9.	5 I L	4 16 B Lt	12 22 C F	21 29 I L	18 30 K N
10.	4 J N	3 16 M Rt	12 23 E G	20 30 K M	17 29 B D

Page 57. Multiply by 15. 40, 3⅓ and 1% off.

	Series 350	Series 351	Series 352	Series 353	Series 354
1.	4 L Rt	2 6 L Rt	5 10 C Lt	10 14 L Rt	17 22 C Lt
2.	4 J M	3 7 J M	4 10 A D	12 16 K N	19 23 A E
3.	5 I L	2 7 H K	6 12 C F	13 18 I L	20 25 C F
4.	5 C Lt	3 8 F I	5 11 D G	14 20 H J	21 27 E G
5.	4 B E	2 7 D H	7 12 E I	14 19 F I	22 28 F I
6.	5 C F	3 8 C F	8 13 G J	15 20 E I	23 30 H J
7.	6 E G	4 8 B E	7 14 I K	16 21 D G	24 30 I L
8.	4 F I	4 9 C Lt	8 12 I M	17 23 C E	22 29 J M
9.	5 H K	3 9 A C	9 15 K N	18 24 B E	25 30 K N
10.	6 J L	5 10 D G	8 14 L Rt	16 22 B Lt	26 30 K Rt

Page 58. Multiply by 6. 40%, 8%, 5%, 2% off

	Series 355		Series 356		Series 357		Series 358		Series 359
1.	5 L Rt	1.	2 6 K Rt	1.	4 10 C Lt	1.	14 18 K Rt	1.	19 23 D Lt
2.	4 J N	2.	3 8 J M	2.	5 11 A D	2.	15 20 J M	2.	18 25 A D
3.	6 I M	3.	2 8 H L	3.	6 12 B F	3.	13 19 I L	3.	19 26 B E
4.	5 G K	4.	3 9 G K	4.	7 13 D G	4.	14 20 H L	4.	20 25 C G
5.	6 F J	5.	4 9 F J	5.	8 14 E H	5.	16 21 G J	5.	22 28 E H
6.	5 E H	6.	5 10 E H	6.	9 13 F J	6.	18 24 F I	6.	24 30 F I
7.	6 C G	7.	3 9 C G	7.	10 16 H K	7.	17 24 E H	7.	23 29 G K
8.	7 B E	8.	4 10 B E	8.	11 16 I L	8.	16 22 D G	8.	26 30 H L
9.	4 A F	9.	2 9 A D	9.	12 17 J M	9.	18 25 C F	9.	24 29 J M
10.	5 D Lt	10.	3 8 C Lt	10.	13 18 K Rt	10.	17 24 C Lt	10.	25 30 L Rt

Page 58. Multiply by 16. 33⅓%, 16⅔%, 6%, ¼% off.

	Series 360		Series 361		Series 362		Series 363		Series 364
1.	4 L Rt	1.	2 6 C Lt	1.	5 10 C Lt	1.	10 14 L Rt	1.	17 22 C Lt
2.	4 J M	2.	3 8 A D	2.	4 10 A D	2.	12 16 K N	2.	19 23 A E
3.	5 I L	3.	2 7 B E	3.	6 12 C F	3.	13 18 I L	3.	20 25 C F
4.	4 C Lt	4.	3 8 L Rt	4.	5 11 D G	4.	14 20 H J	4.	21 26 D G
5.	5 B E	5.	2 8 J M	5.	7 12 E H	5.	12 17 E H	5.	23 29 F I
6.	6 C F	6.	3 7 H L	6.	6 12 L Rt	6.	14 19 F I	6.	24 30 G J
7.	5 D G	7.	4 8 G J	7.	5 12 K M	7.	15 20 D H	7.	22 28 L Rt
8.	4 E I	8.	2 8 F I	8.	5 11 H K	8.	16 21 C F	8.	20 27 K M
9.	6 G J	9.	3 8 E H	9.	6 12 G J	9.	18 24 B E	9.	24 30 I L
10.	5 H K	10.	4 9 C F	10.	4 11 F H	10.	15 21 A D	10.	22 30 G I

Page 59. Multiply by 7. 33⅓%, 15%, 5% off.

	Series 365		Series 366		Series 367		Series 368		Series 369
1.	4 L Rt	1.	2 8 E H	1.	6 12 I L	1.	14 20 K N	1.	23 28 A D
2.	6 K N	2.	3 9 D G	2.	5 11 H K	2.	15 21 L Rt	2.	22 29 B E
3.	5 I M	3.	2 9 C F	3.	7 14 L Rt	3.	13 20 J M	3.	21 28 L Rt
4.	6 H L	4.	3 10 B E	4.	6 13 K N	4.	16 20 H L	4.	22 27 J N
5.	7 G J	5.	2 10 C Lt	5.	8 14 C Lt	5.	17 22 G K	5.	23 29 I L
6.	6 F I	6.	4 9 F J	6.	9 16 B E	6.	18 23 F I	6.	24 30 H K
7.	8 E H	7.	3 10 H K	7.	10 14 G L	7.	19 25 E H	7.	20 25 F J
8.	7 C G	8.	4 12 L Rt	8.	11 16 F J	8.	20 26 D G	8.	21 29 E G
9.	6 B F	9.	3 11 I K	9.	12 18 D G	9.	21 28 C Lt	9.	22 28 C F
10.	7 C Lt	10.	5 10 J N	10.	13 19 A D	10.	22 27 A E	10.	23 29 C Lt

Page 59. Multiply by 17, 40, 15, 2½% off.

	Series 370		Series 371		Series 372		Series 373		Series 374
1.	4 L Rt	1.	2 6 C Lt	1.	5 10 C Lt	1.	9 14 L Rt	1.	17 22 C Lt
2.	4 J M	2.	2 8 A D	2.	4 11 A D	2.	12 16 K N	2.	19 24 A E
3.	5 I L	3.	2 7 B E	3.	6 12 C F	3.	13 17 I L	3.	20 25 C F
4.	6 C Lt	4.	3 8 L Rt	4.	5 11 D G	4.	14 20 H J	4.	21 26 D G
5.	5 B E	5.	2 7 J M	5.	7 12 E H	5.	12 17 E H	5.	23 29 F I
6.	6 C F	6.	3 7 H L	6.	5 12 L Rt	6.	14 19 F I	6.	25 30 G J
7.	5 D G	7.	4 8 G J	7.	6 12 K M	7.	15 21 D H	7.	22 28 L Rt
8.	4 E I	8.	2 8 F I	8.	5 11 H K	8.	16 21 C F	8.	20 26 K M
9.	5 G J	9.	3 9 E H	9.	6 12 G J	9.	18 24 B E	9.	24 30 I L
10.	6 H K	10.	4 9 C F	10.	4 11 F H	10.	15 21 A D	10.	25 30 G I

Page 60. Multiply by 8, 20, 12½, 8. ⅛% off.

	Series 375		Series 376		Series 377		Series 378		Series 379
1.	4 L Rt	1.	2 8 E H	1.	6 12 I L	1.	15 20 K N	1.	23 28 A D
2.	6 K N	2.	3 9 D G	2.	5 11 H K	2.	15 21 L Rt	2.	22 29 B E
3.	5 I M	3.	2 9 C F	3.	7 13 L Rt	3.	13 20 J M	3.	21 27 L Rt
4.	6 H L	4.	3 10 B E	4.	6 13 K N	4.	16 21 H L	4.	22 27 J N
5.	7 G J	5.	2 10 C Lt	5.	8 14 C Lt	5.	17 22 G K	5.	23 29 I L
6.	6 F I	6.	4 9 F J	6.	9 16 B E	6.	18 23 F I	6.	24 30 H K
7.	8 E H	7.	3 10 H K	7.	10 14 G L	7.	19 25 E H	7.	20 25 F J
8.	6 C G	8.	4 11 L Rt	8.	11 16 F J	8.	20 26 D G	8.	21 29 E G
9.	6 B F	9.	3 10 I K	9.	12 18 D G	9.	21 28 C Lt	9.	22 28 C F
10.	7 C Lt	10.	5 10 J N	10.	13 19 A D	10.	22 27 A E	10.	23 29 C Lt